

# FIG. 1

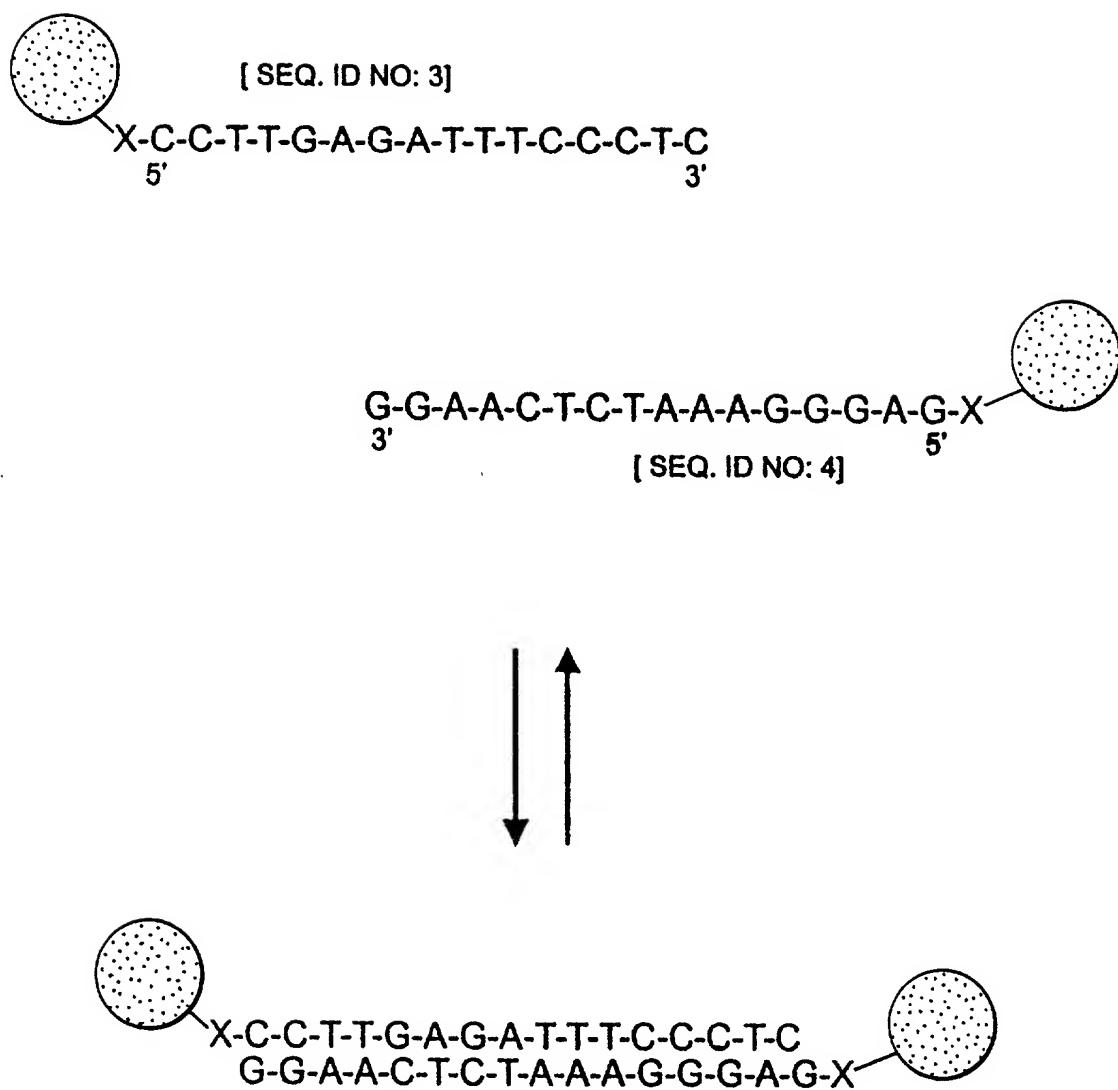


FIG. 2

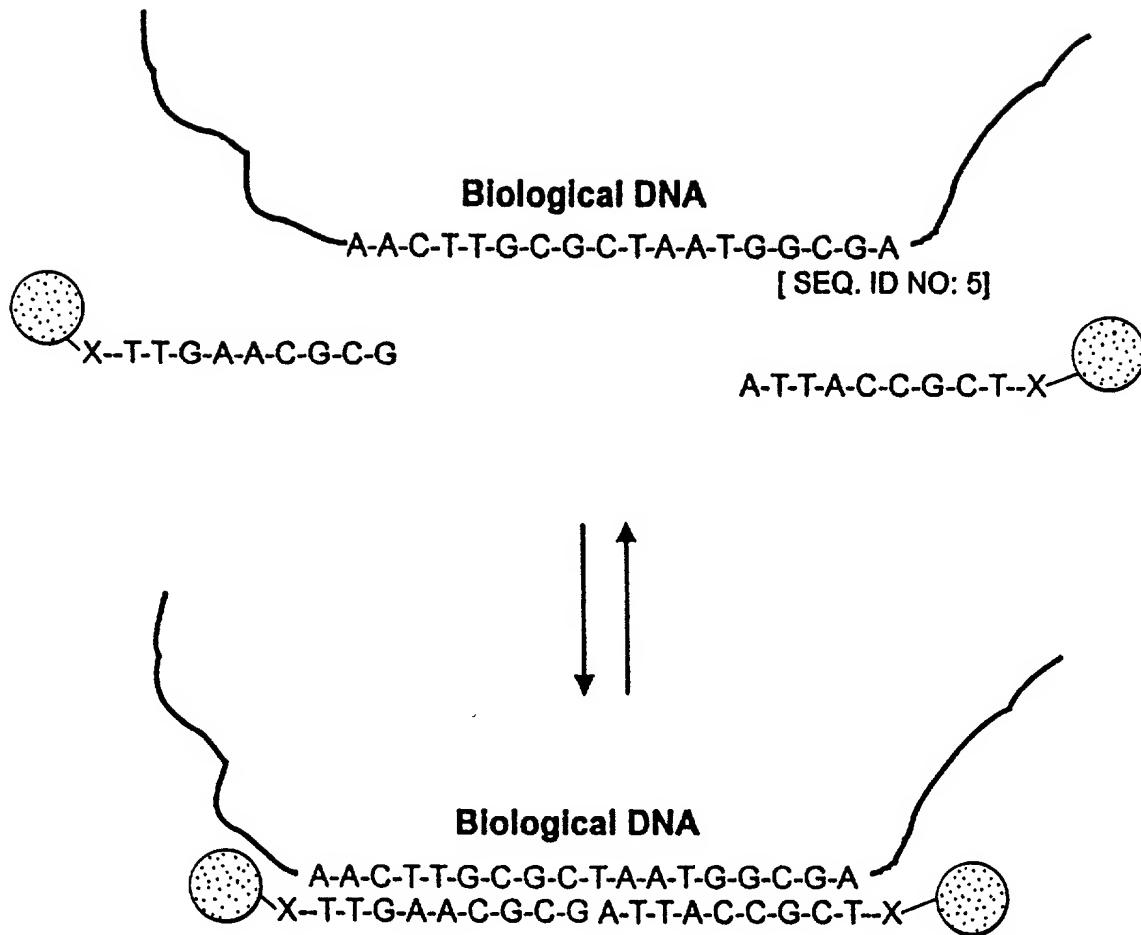
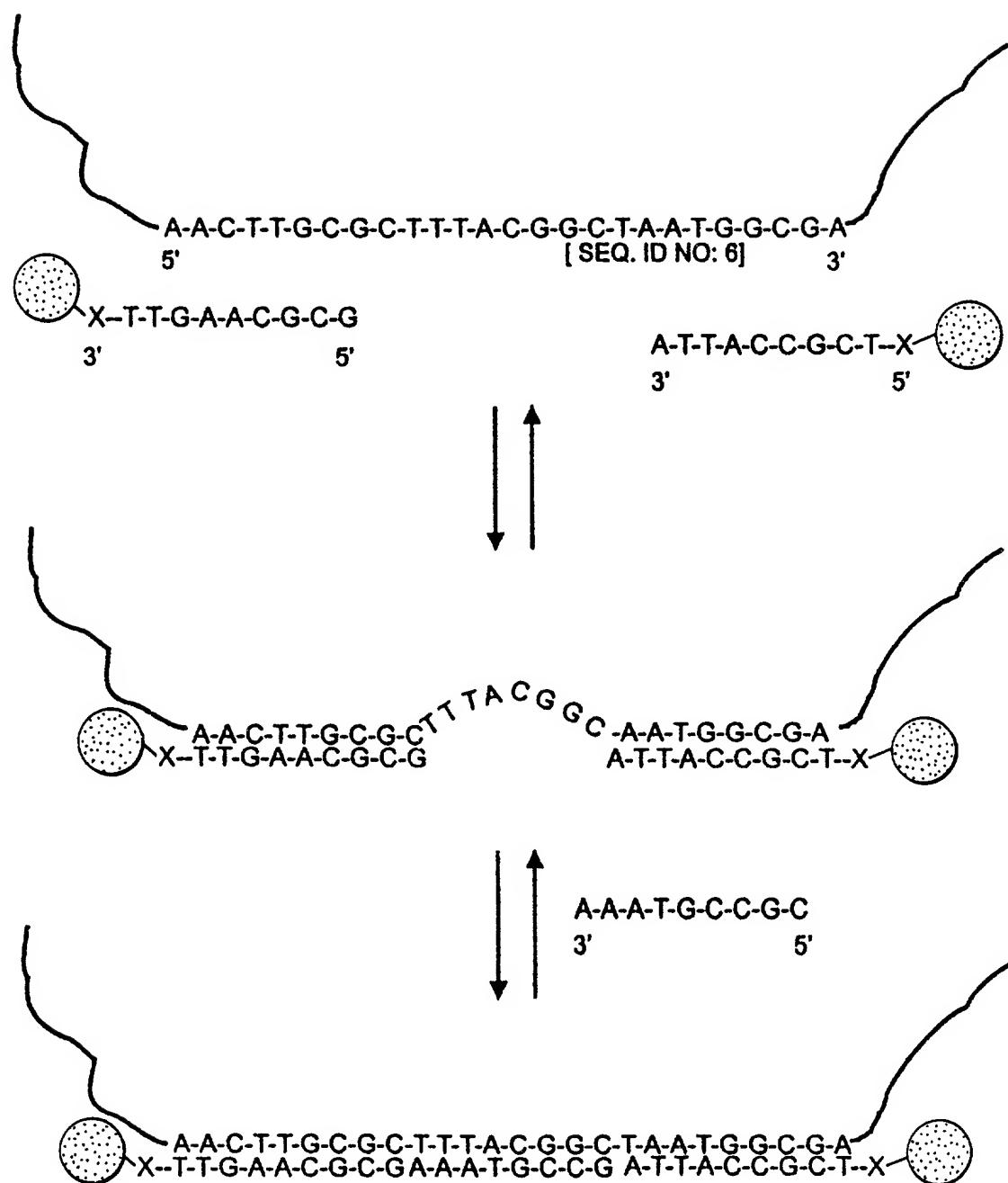
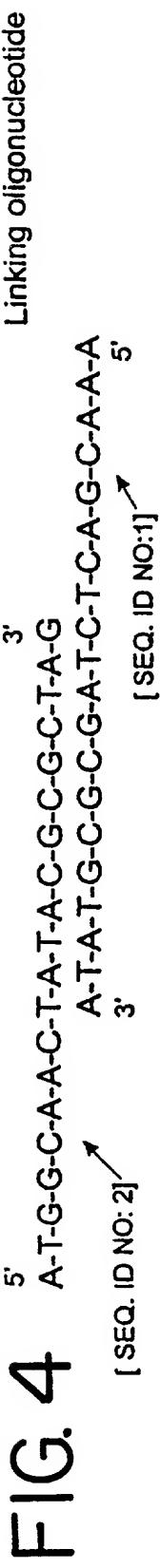


FIG. 3



**FIG. 4** 
  
Linking oligonucleotide

[SEQ. ID NO: 2] →

[SEQ. ID NO: 1] →

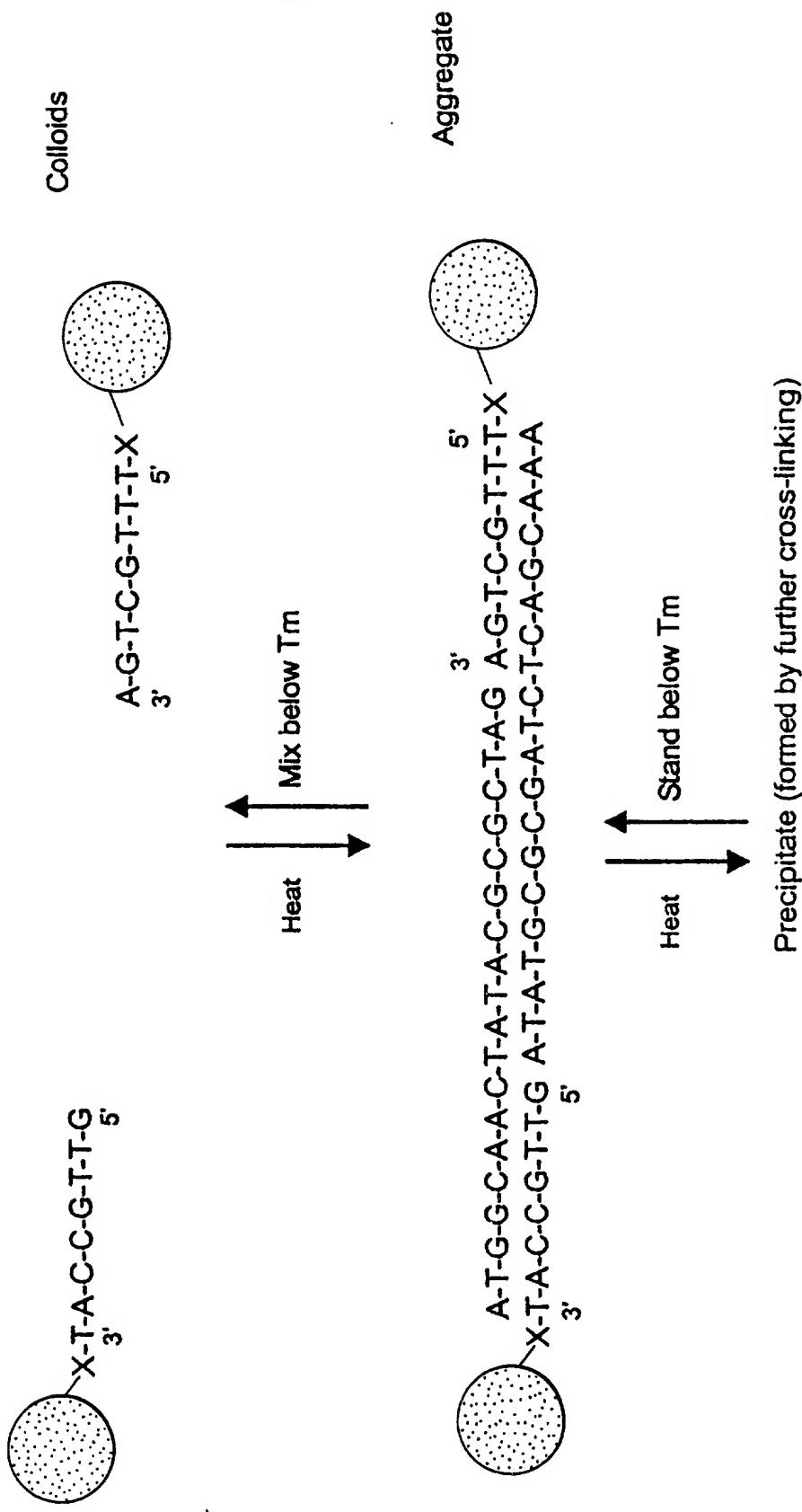


FIG. 5

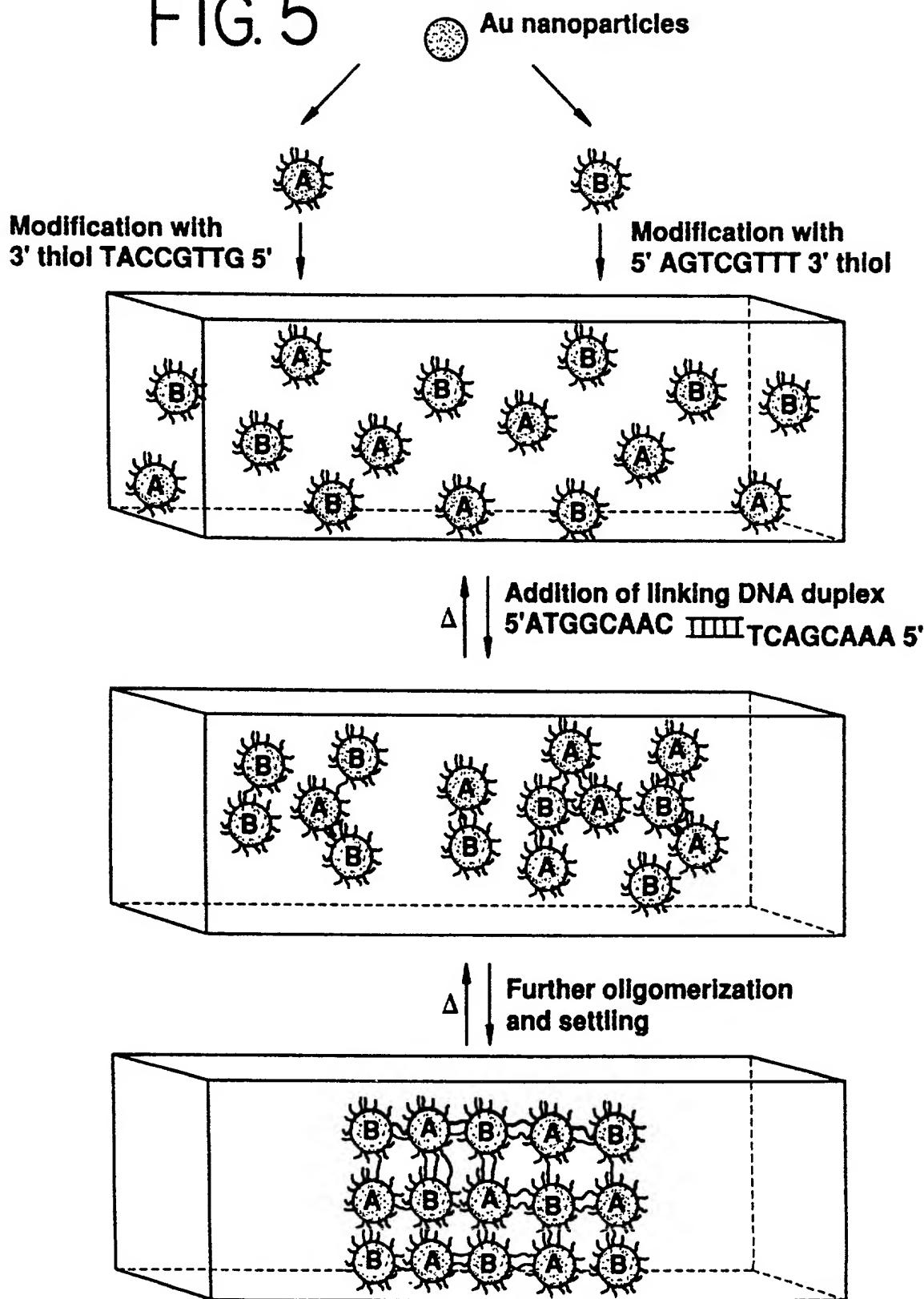


FIG.6A FIG.6B FIG.6C



FIG. 7

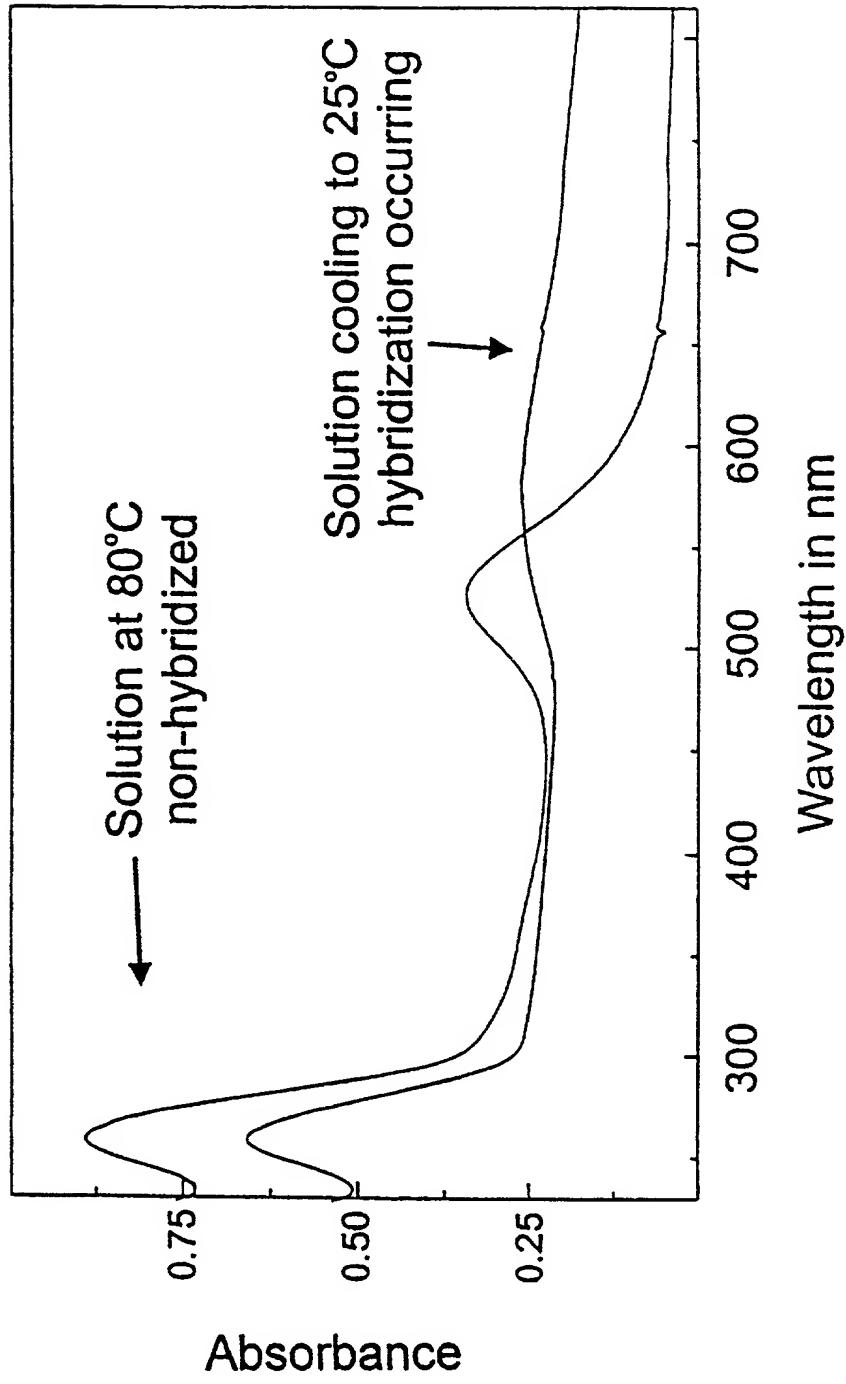


FIG. 8A

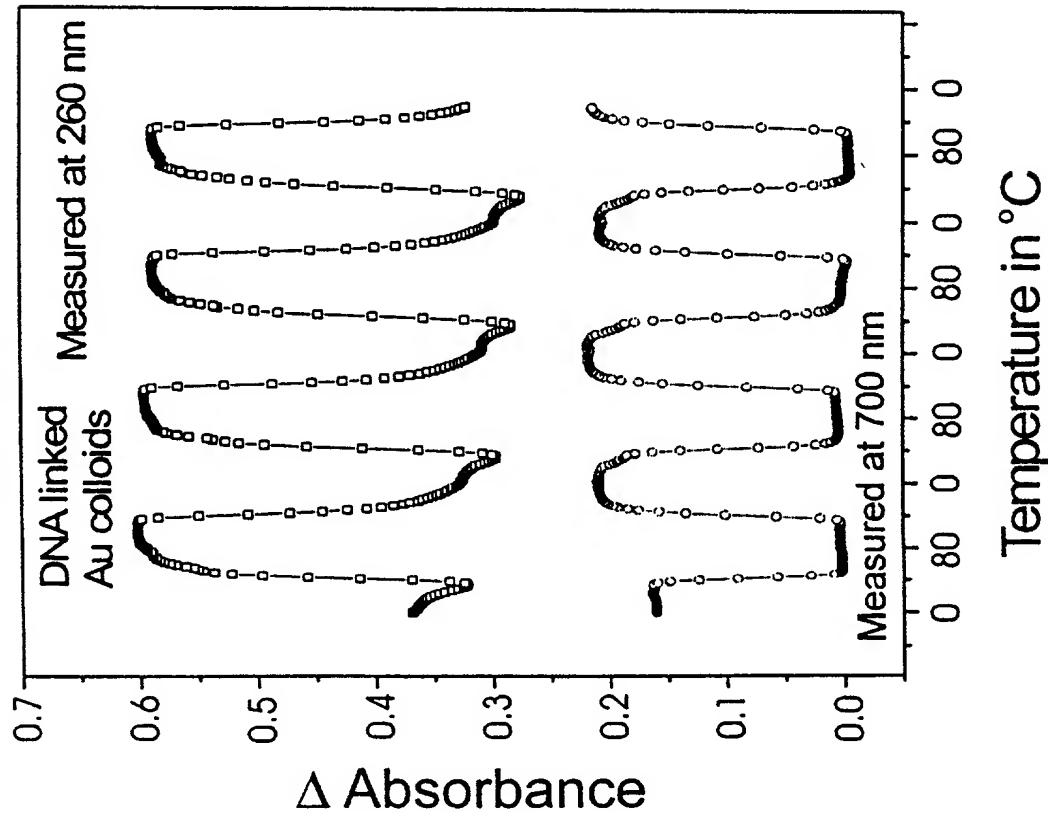
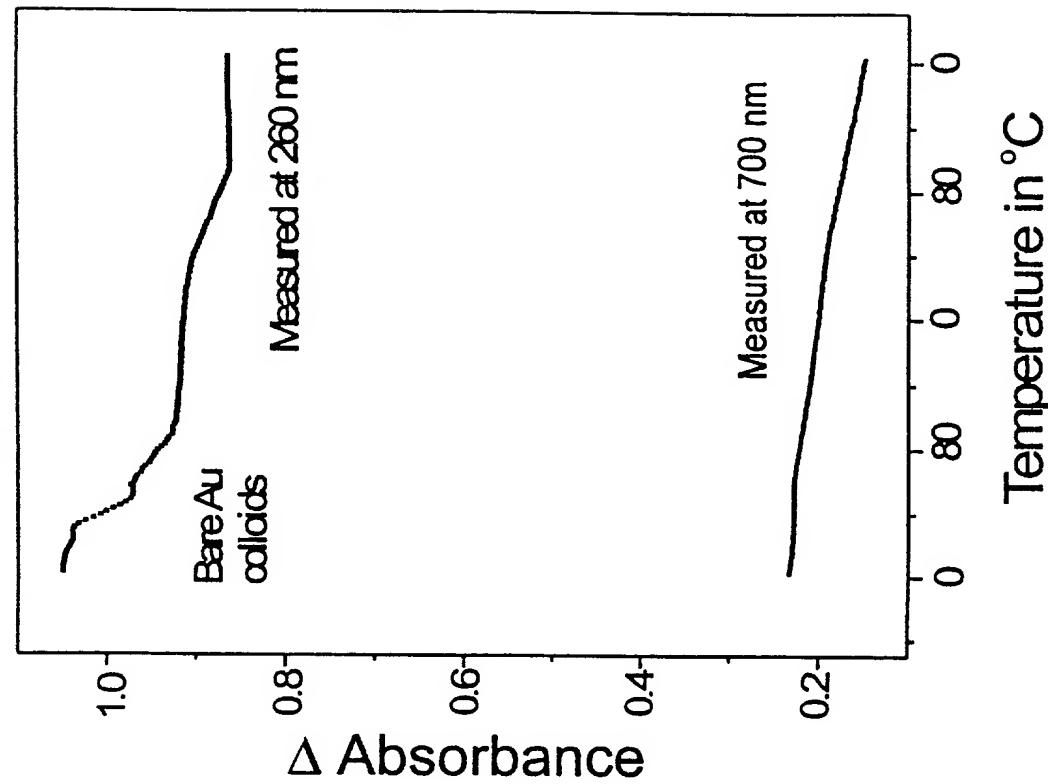


FIG. 8B



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FIG. 9A

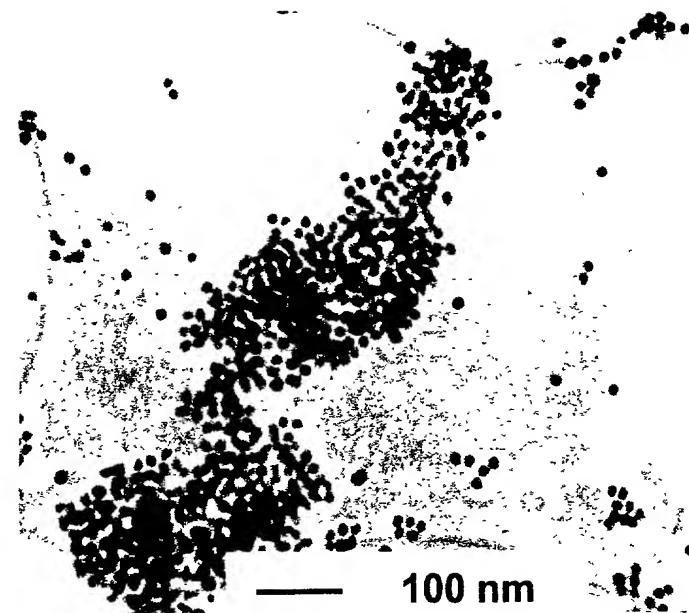
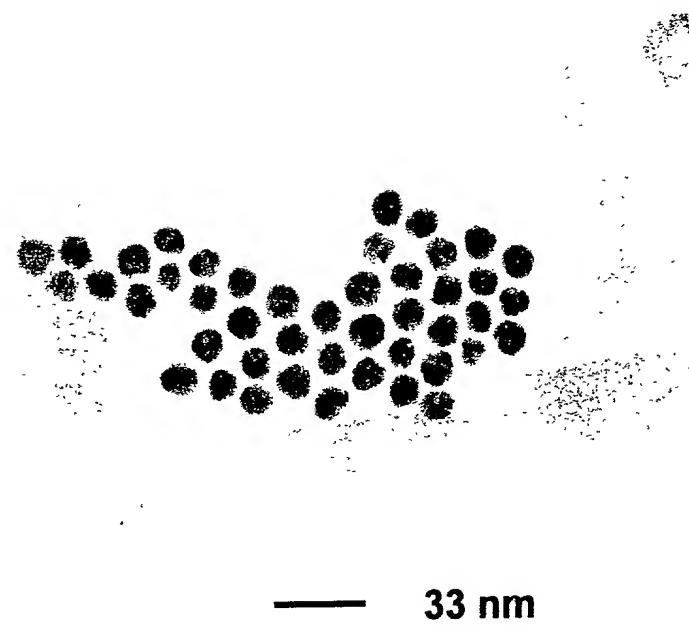
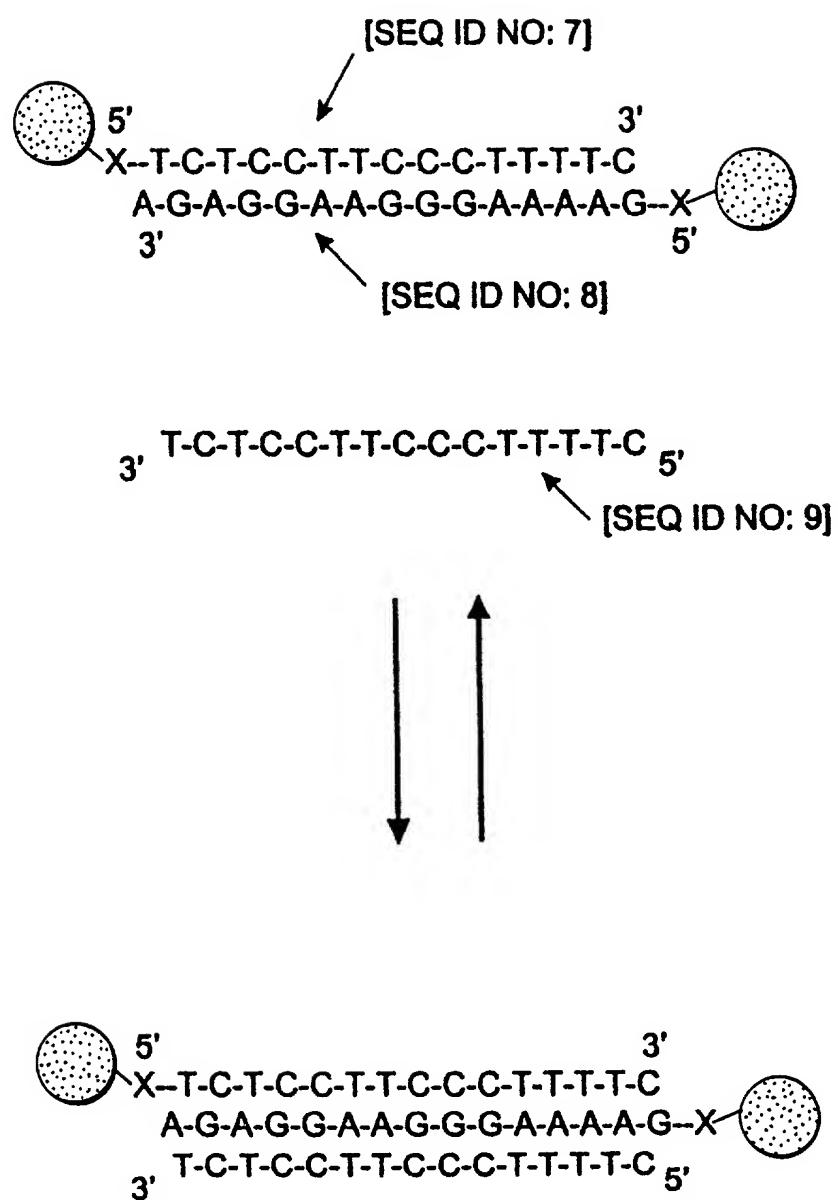


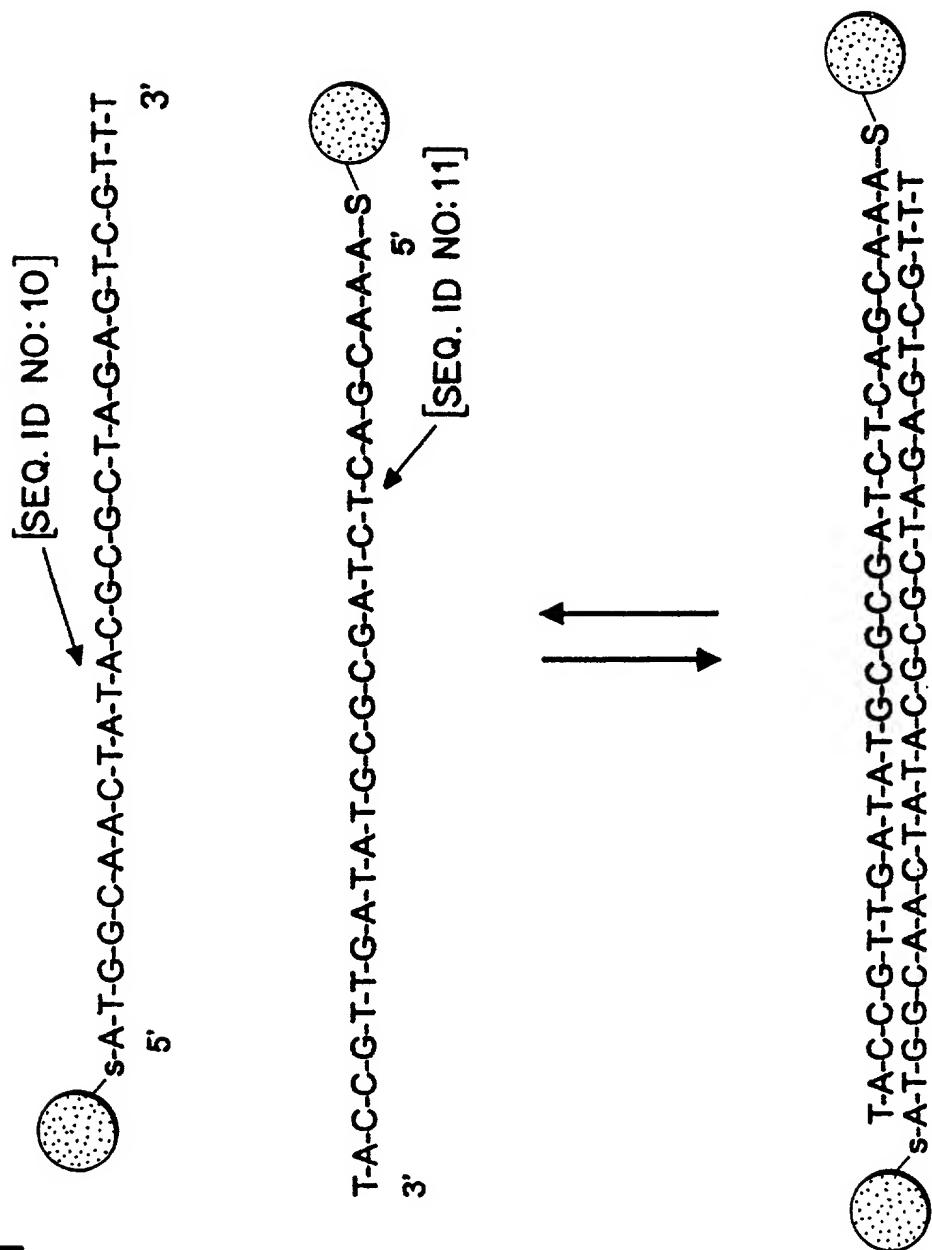
FIG. 9B



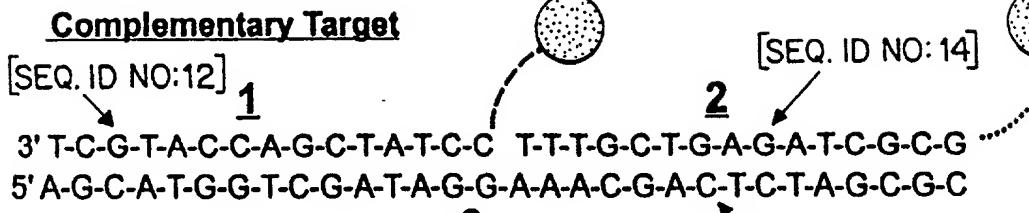
## FIG. 10



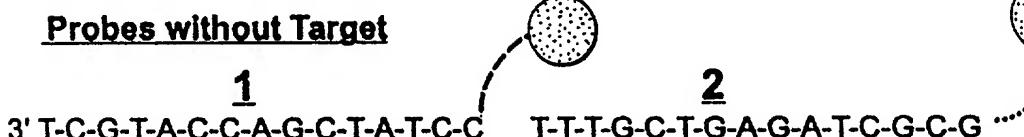
## FIG. I



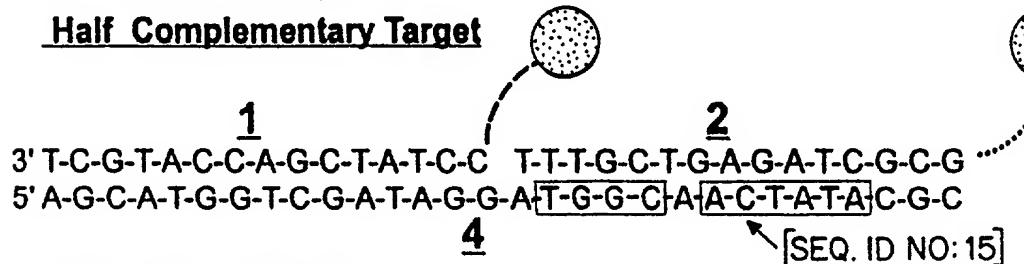
# FIG. I2A



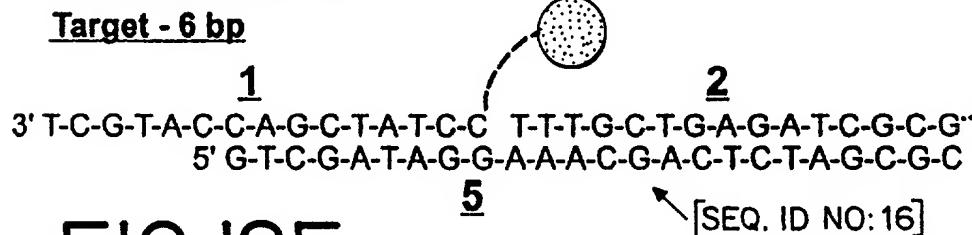
# FIG. I2B



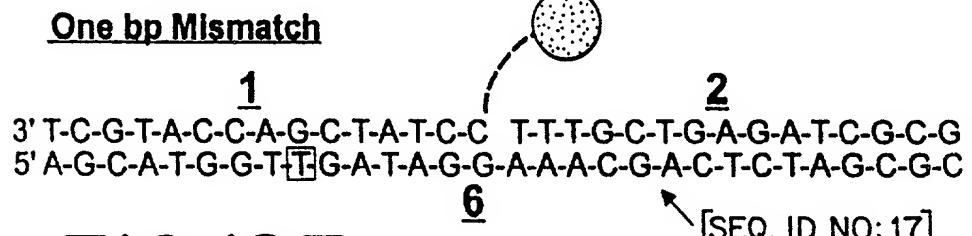
# FIG. I2C



# FIG. I2D



# FIG. I2E



# FIG. I2F

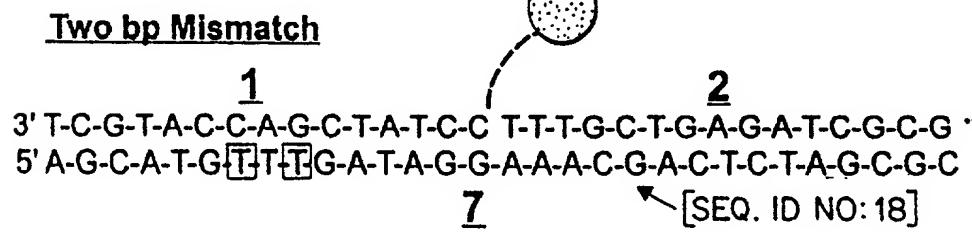
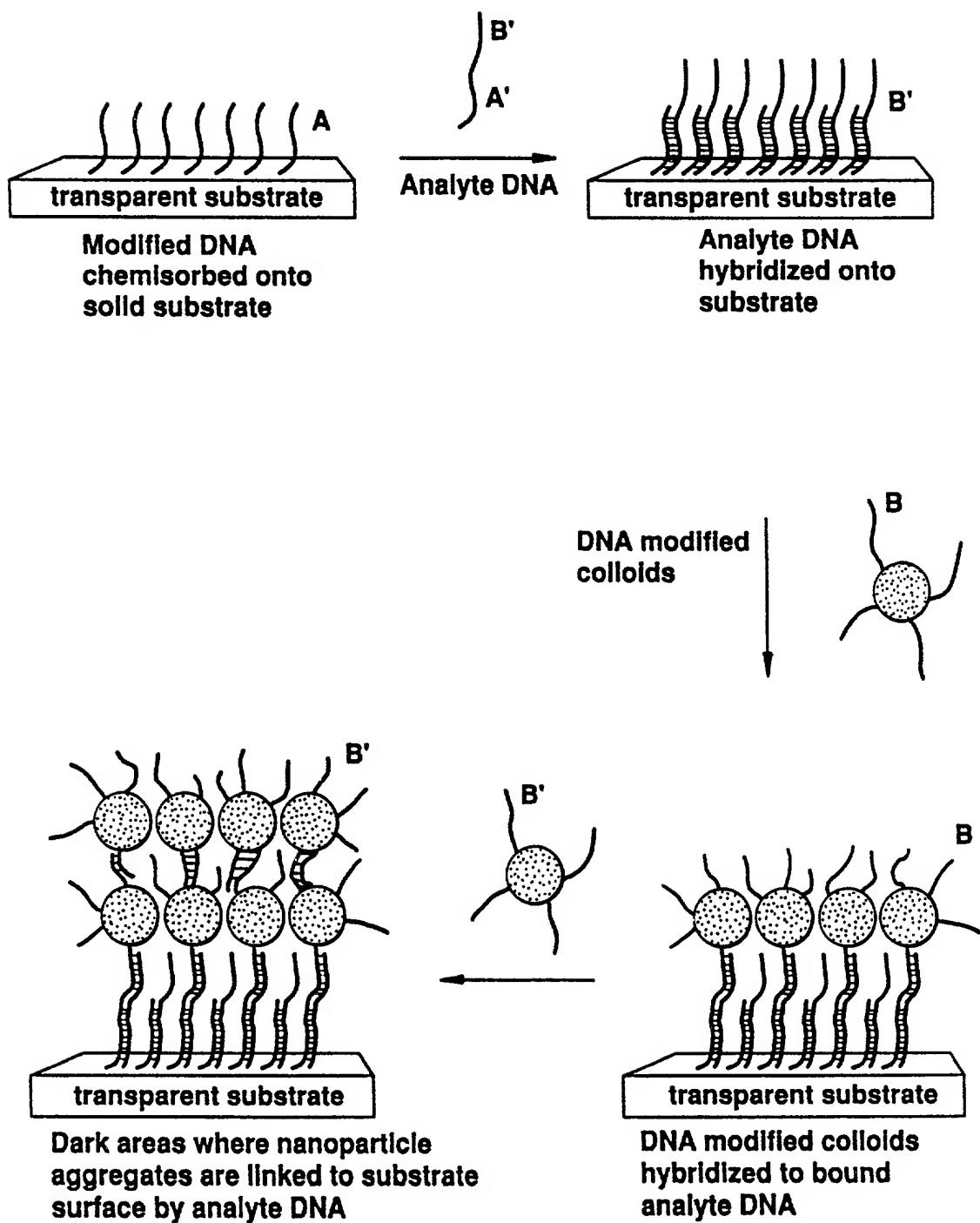


FIG. 13A



**FIG. 13B**

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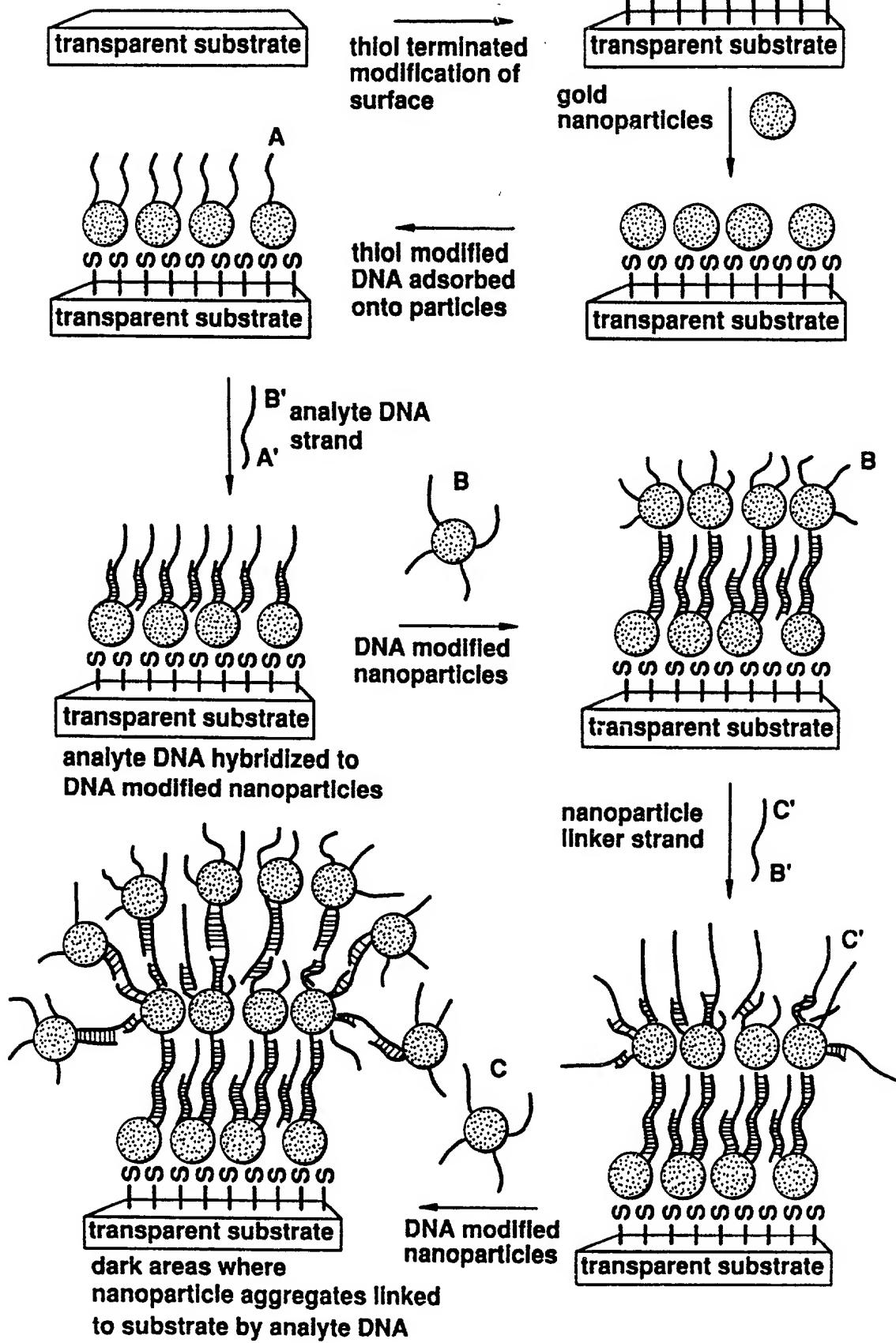


FIG. I4A

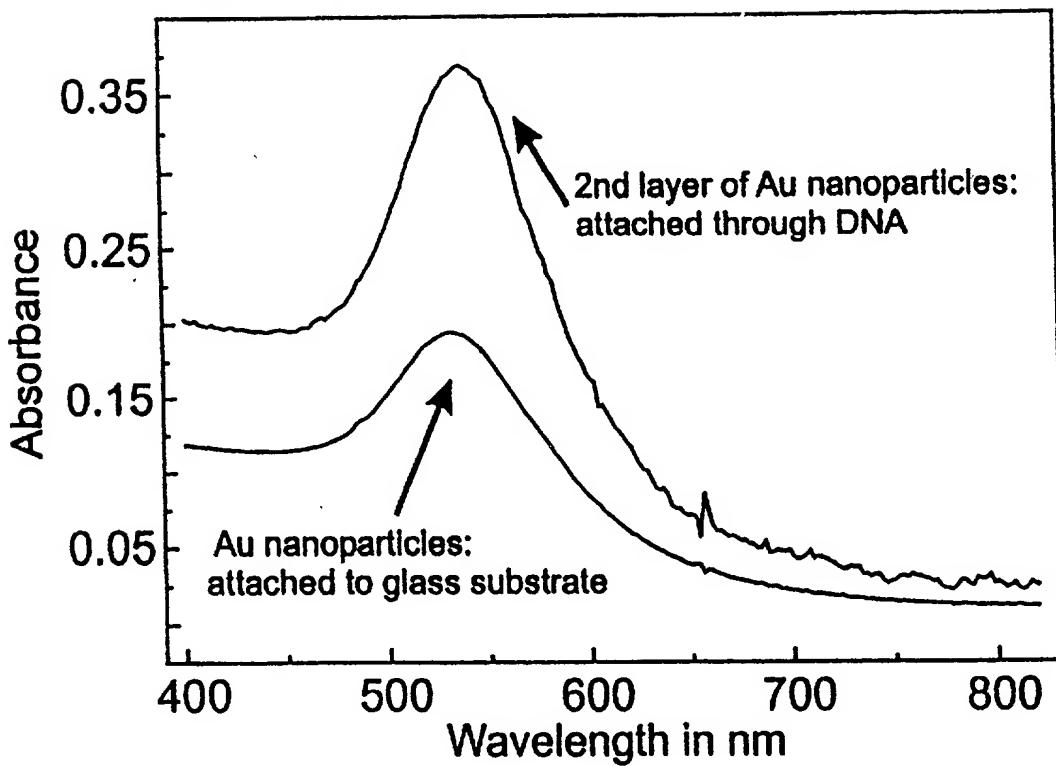
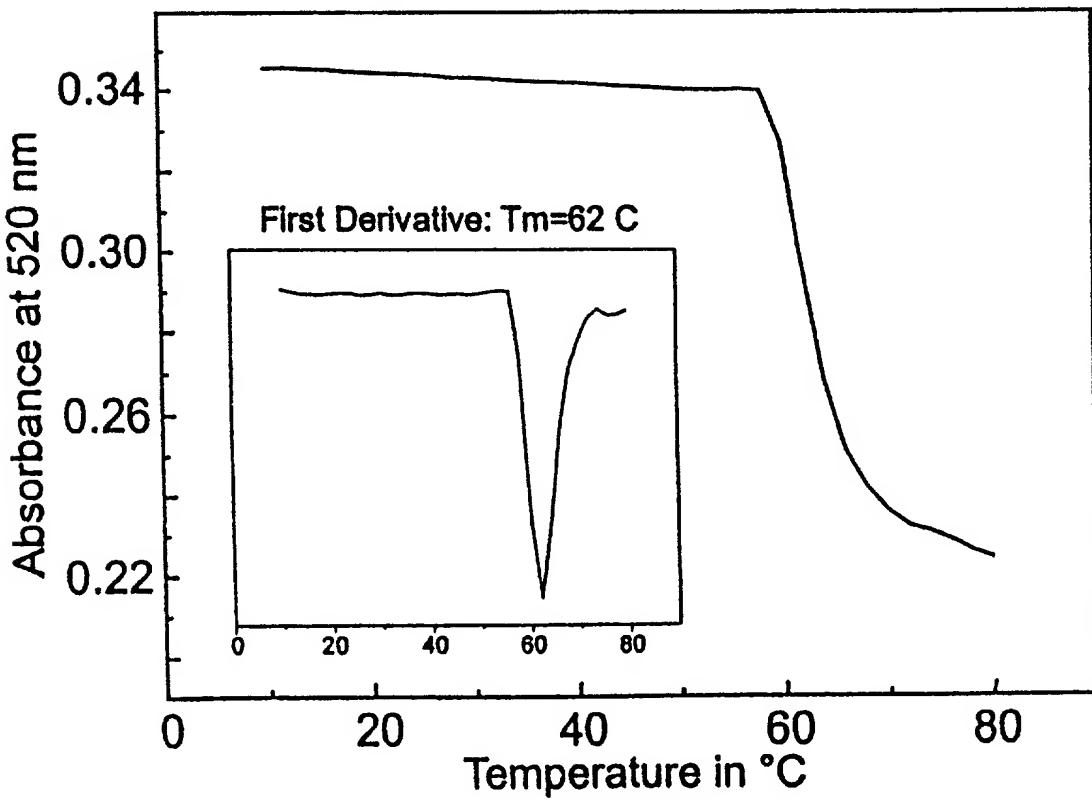
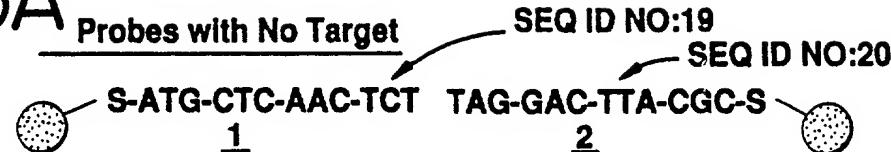


FIG. I4B

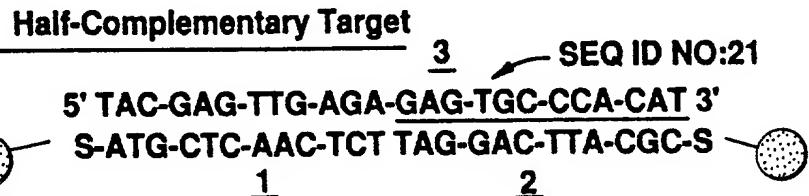


**FIG. 15A**

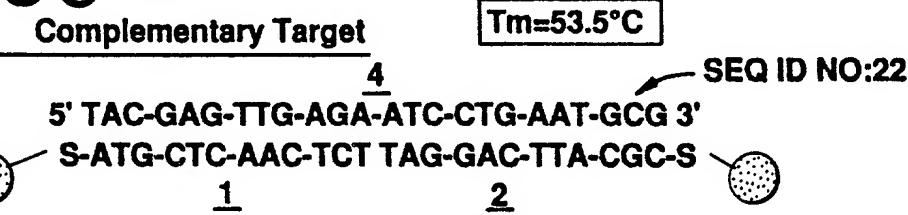
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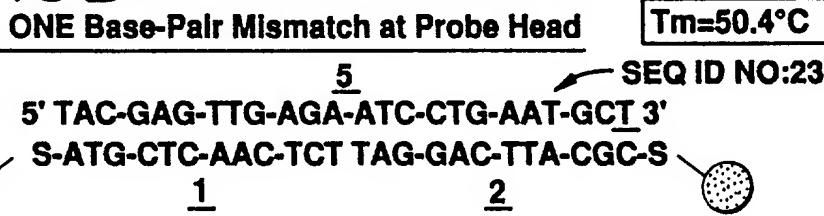
**FIG. 15B**



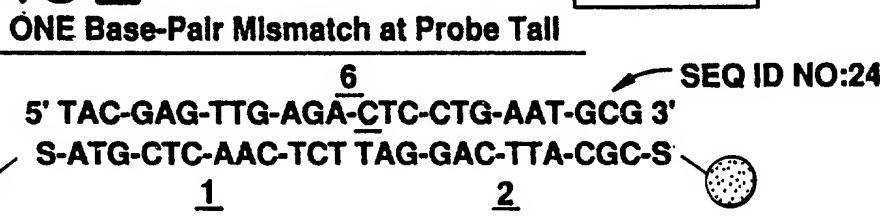
**FIG. 15C**



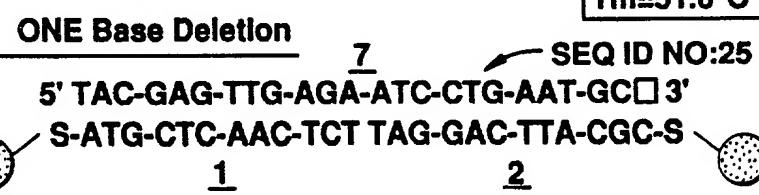
**FIG. 15D**



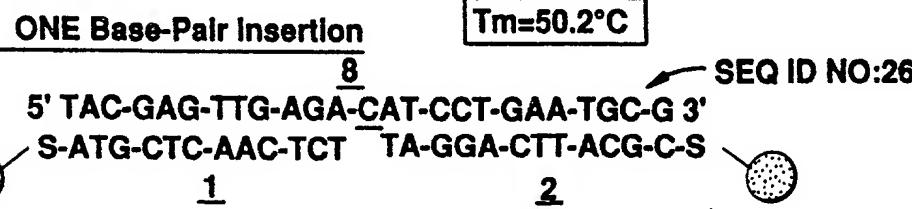
**FIG. 15E**



**FIG. 15F**



**FIG. 15G**



## FIG. 16A

### 24 Base Template

5' TAC-GAG-TTG-AGA-CCG-TTA-AGA-CGA-GGC-AAT-CAT-GCA-ATC-CTG-AAT-GCG 3'  
—S-ATG-CTC-AAC-TCT TAG-GAC-TTA-CGC-S —  
1  
2

## FIG. 16B

### 48 Base Template with Complementary 24 Base Filler

5' TAC-GAG-TTG-AGA-CCG-TTA-AGA-CGA-GGC-AAT-CAT-GCA-ATC-CTG-AAT-GCG 3'  
—S-ATG-CTC-AAC-TCT GGC-AAT-TCT-GCT-CCG-TTA-GTA-CGT TAG-GAC-TTA-CGC-S —  
1  
2

## FIG. 16C

### 72 Base Template with Complementary 48 Base Filler

5' TAC-GAG-TTG-AGA-CCG-TTA-AGA-CGA-GGC-AAT-CAT-GCA-TAT-ATT-GGA-CGC-TTT-ACG-GAC-AAC-ATC-CTG-AAT-GCG 3'  
—S-ATG-CTC-AAC-TCT GGC-AAT-TCT-GCT-CCG-TTA-GTA-CGT-TAA-CCT-GCG-CTG-TTG TAG-GAC-TTA-CGC-S —  
1  
2

FIG. 17A

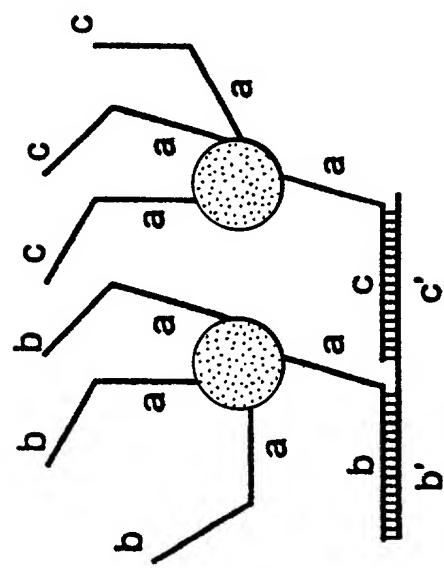


FIG. 17B

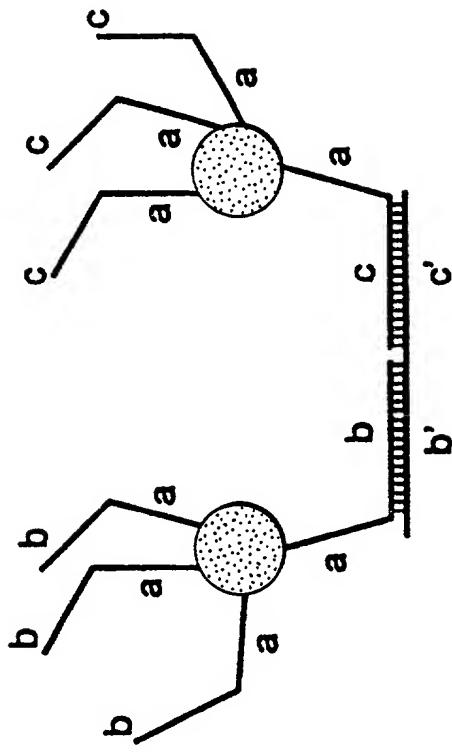


FIG. 17C

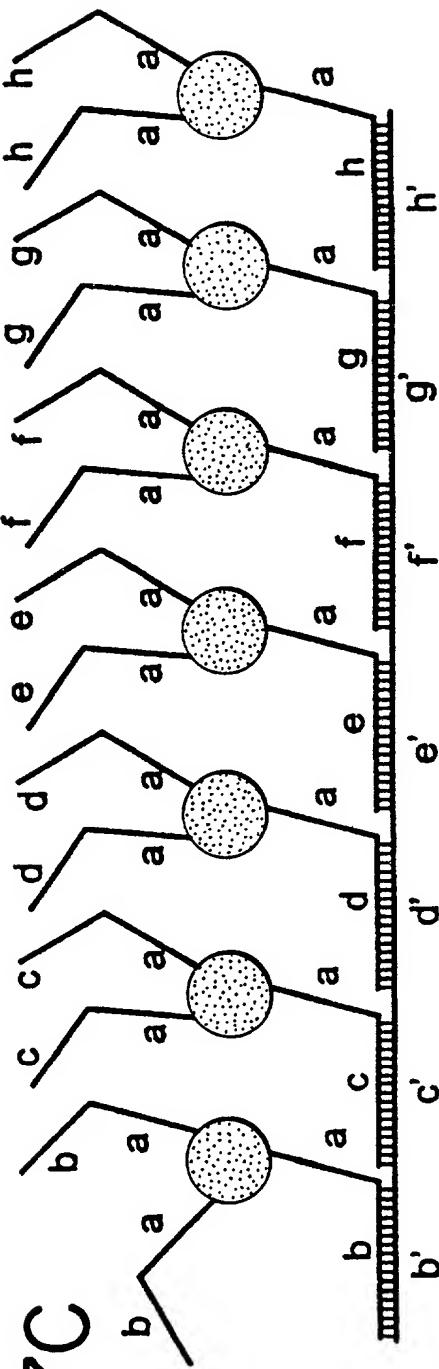


FIG. 17D

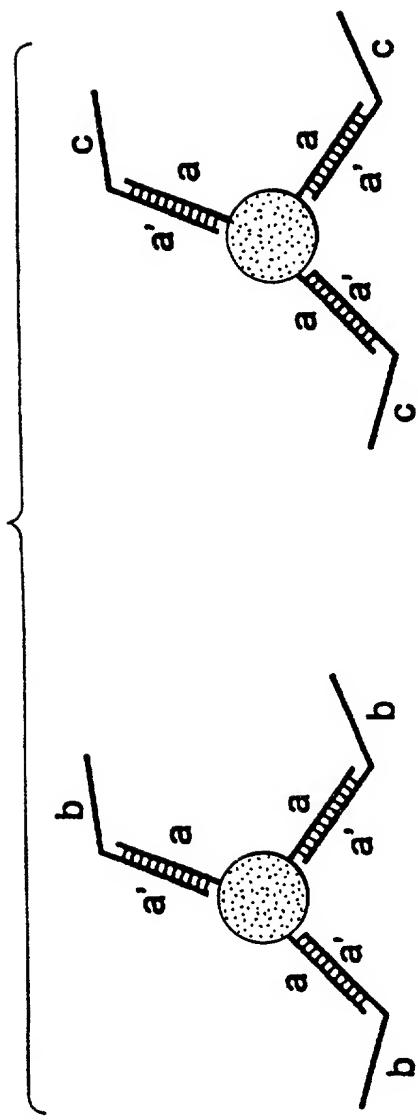


FIG. 17E

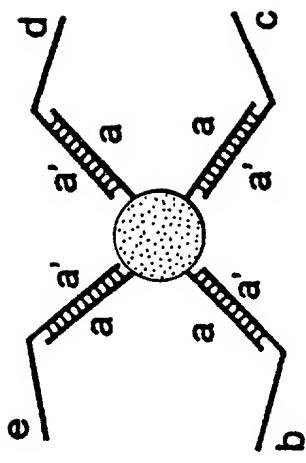


FIG. 18

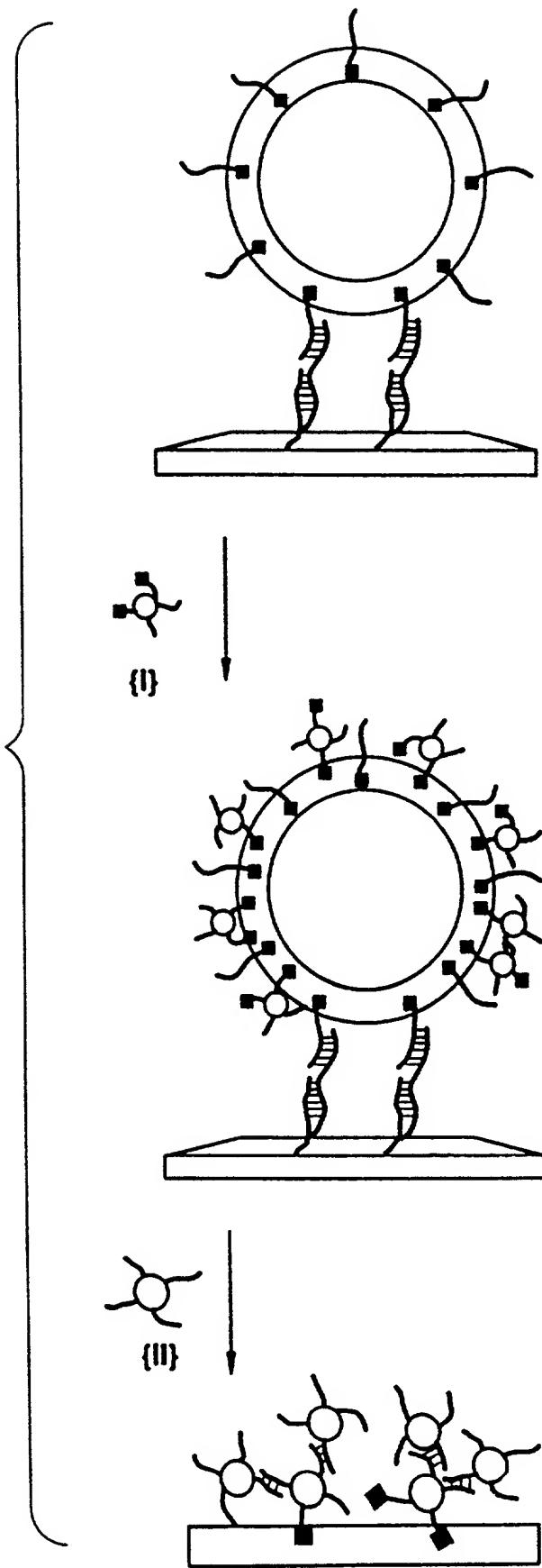


FIG. 19A

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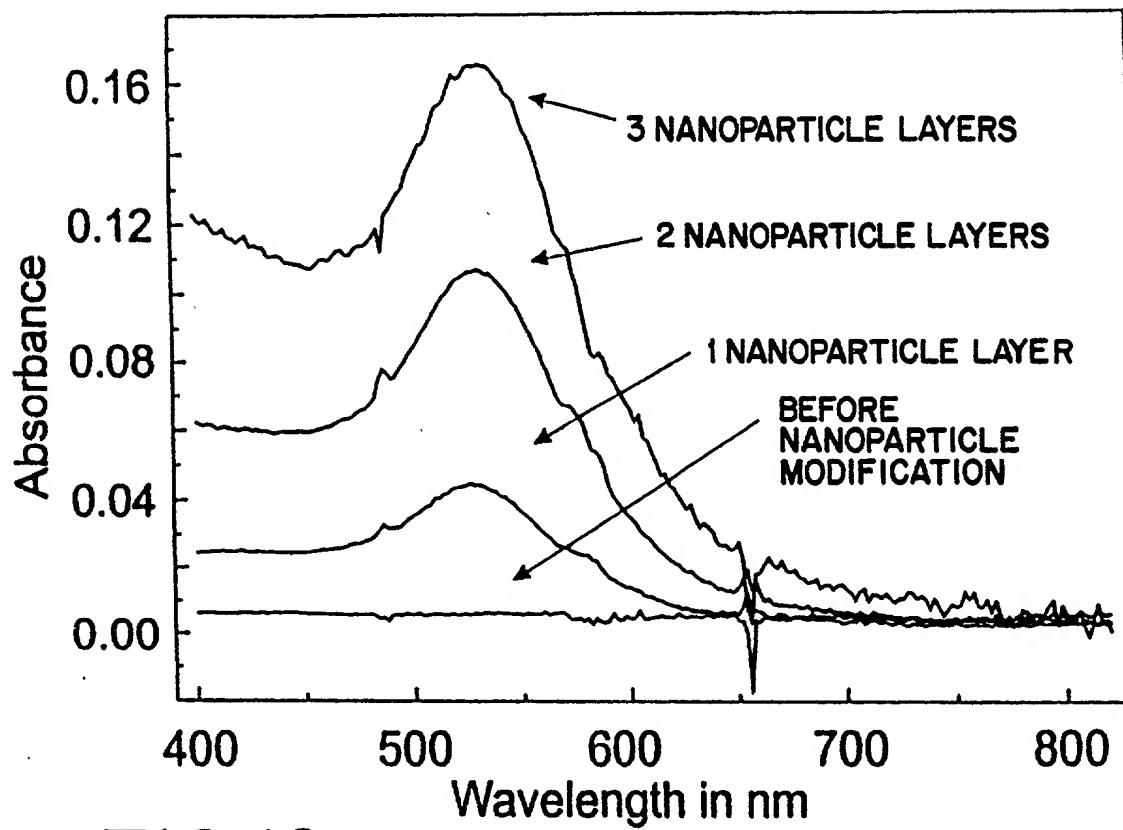
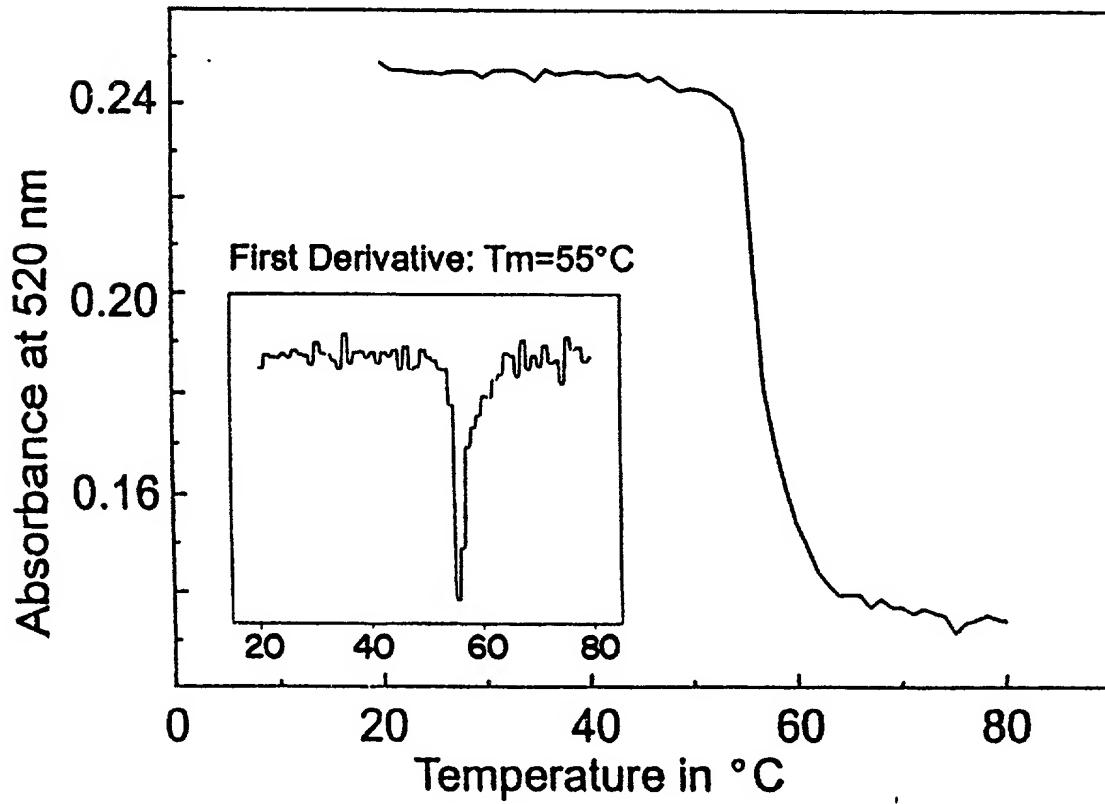
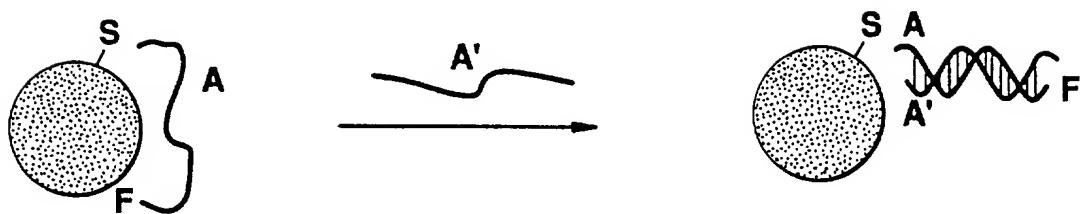


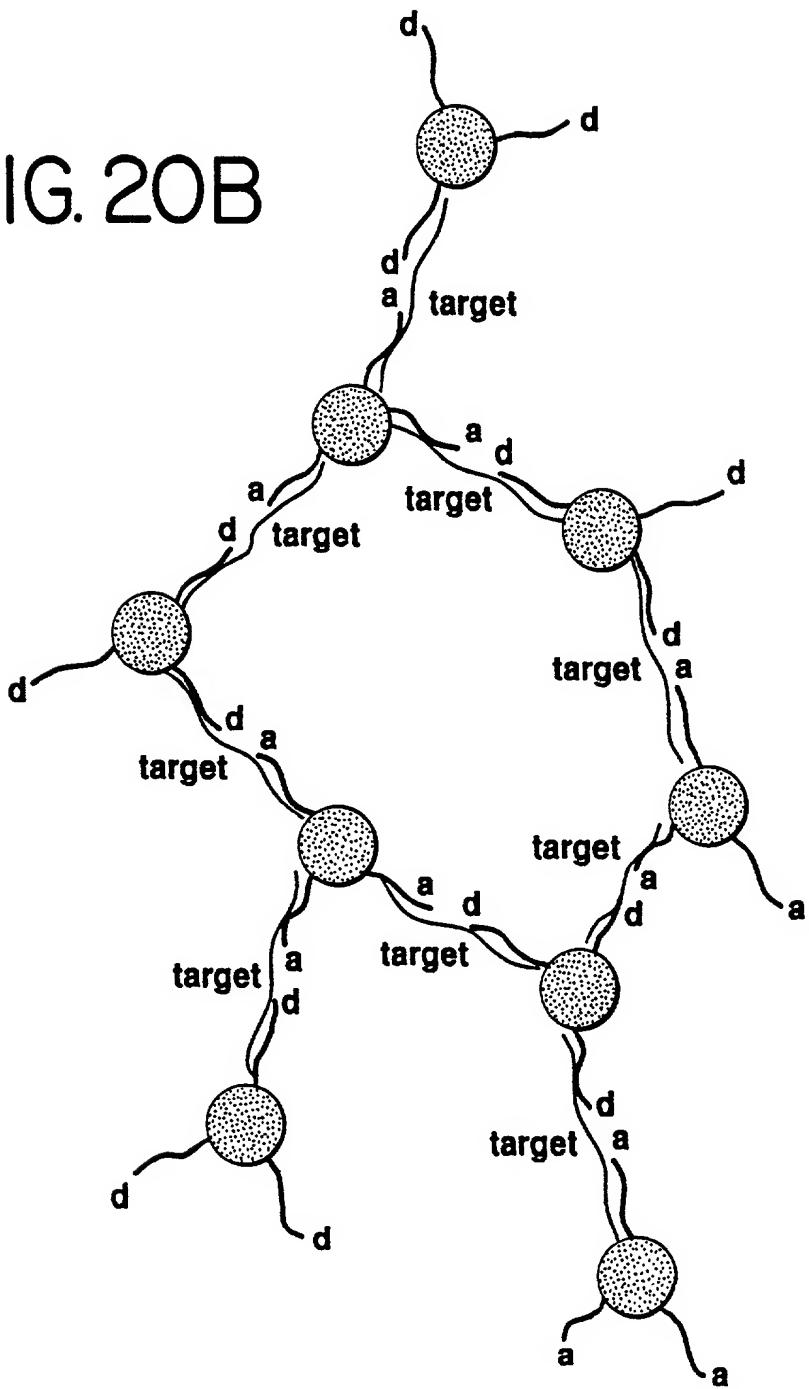
FIG. 19B



**FIG. 20A**



**FIG. 20B**



**FIG. 21**

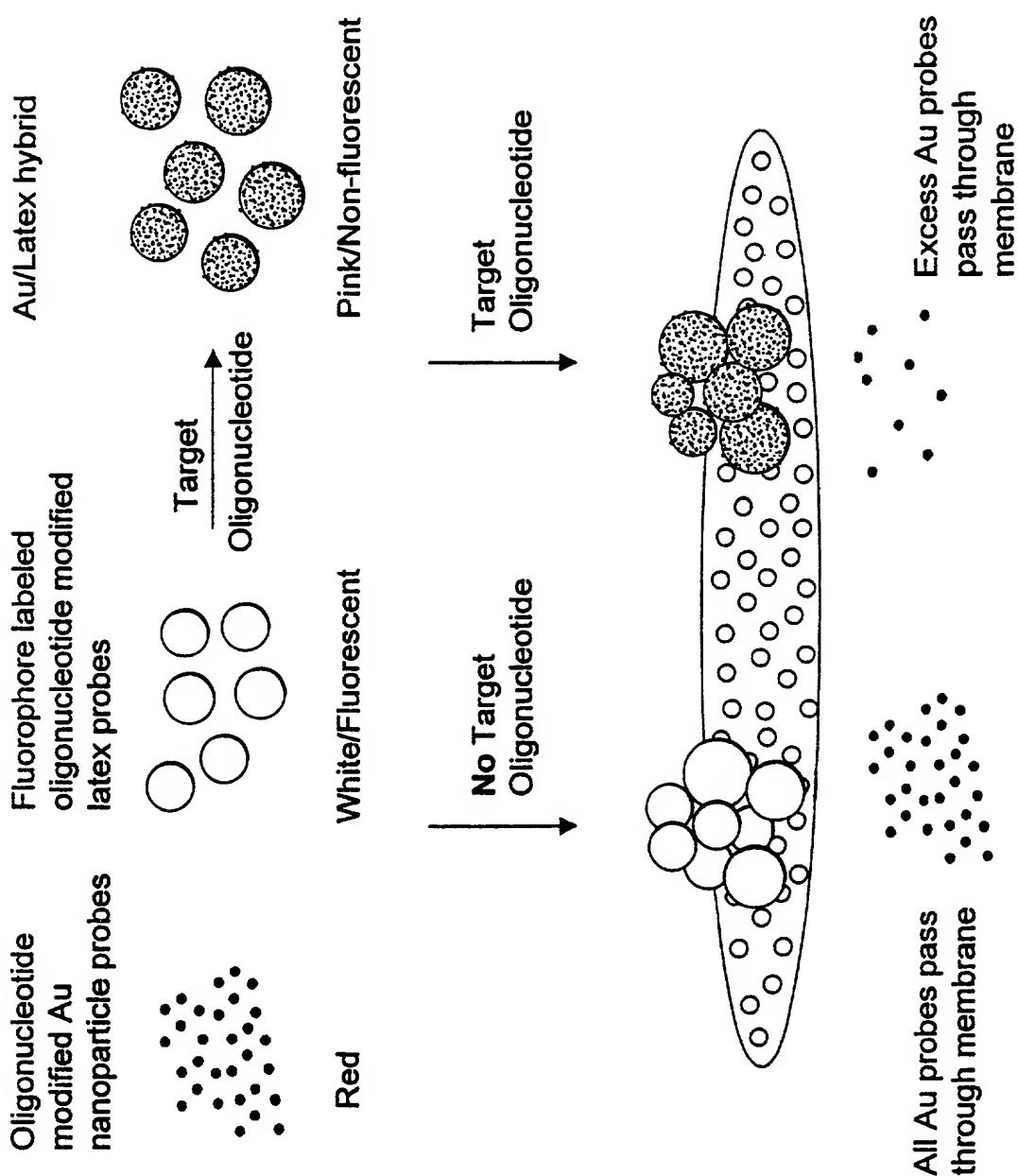
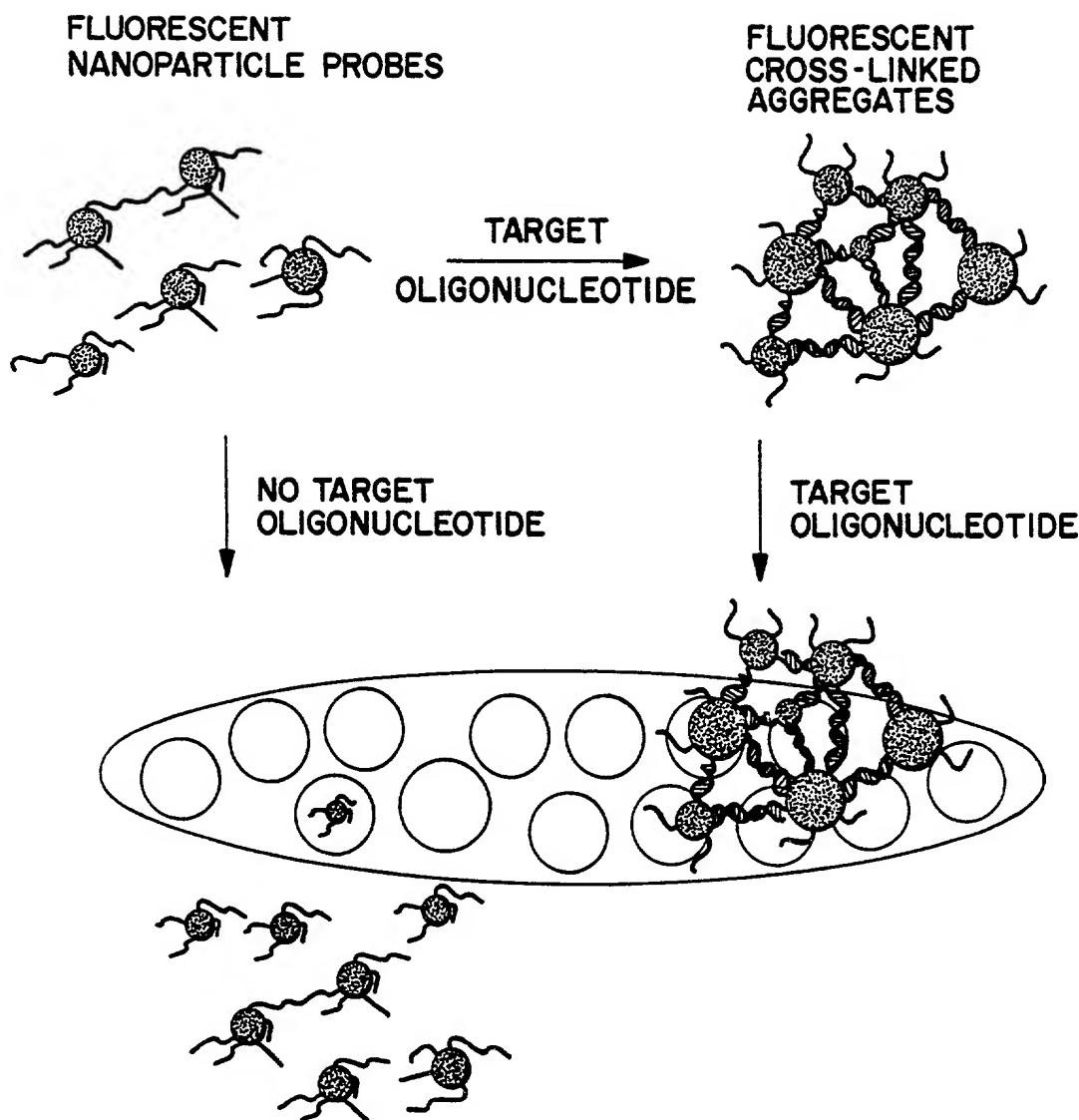


FIG. 22



THE FLUORESCENT NANOPARTICLE PROBES PASS THROUGH THE MEMBRANE

THE FLUORESCENT CROSS-LINKED AGGREGATES ARE RETAINED BY THE MEMBRANE

# FIG. 23

## Anthrax PCR Product

5'G GCG GAT GAG TCA GTA GTT AAG GAG GCT CAT AGA GAA GTA ATT AAT  
 3'C CGC CTA CTC AGT CAT CAA TTC CTC CGA GTA TCT CTT CAT TAA TTA

TCG TCA ACA GAG GGA TTA TTG TTA AAT ATT GAT AAG GAT ATA AGA AAA  
 AGC AGT TGT CTC CCT AAT AAC AAT TTA TAA CTA TTC CTA TAT TCT TTT

ATA TTA TCC AGG GTT ATA TTG TAG AAA TTG AAG ATA CTG AAG GGC TT 3'  
 TAT AAT AGG TCC CAA TAT AAC ATC TTT AAC TTC TAT GAC TTC CCG AA 5'

**141 mer Anthrax PCR product [SEQ ID NO:36]**

3' CTC CCT AAT AAC AAT

[SEQ ID NO:37]

3' TTA TAA CTA TTC CTA

[SEQ ID NO:38]

Oligonucleotide-Nanoparticle Probes

## Blocker Oligonucleotides

3' C CGC CTA CTC AGT CAT CAA TTC CTC CGA GT  
 3' A TCT CTT CAT TAA TTA AGC AGT TGT  
 3' TAT TCT TTT TAT AAT AGG TCC CAA TAT  
 3' AAC ATC TTT AAC TTC TAT GAC TTC CCG AA

[SEQ ID NO:39]  
 [SEQ ID NO:40]  
 [SEQ ID NO:41]  
 [SEQ ID NO:42]

FIG. 24

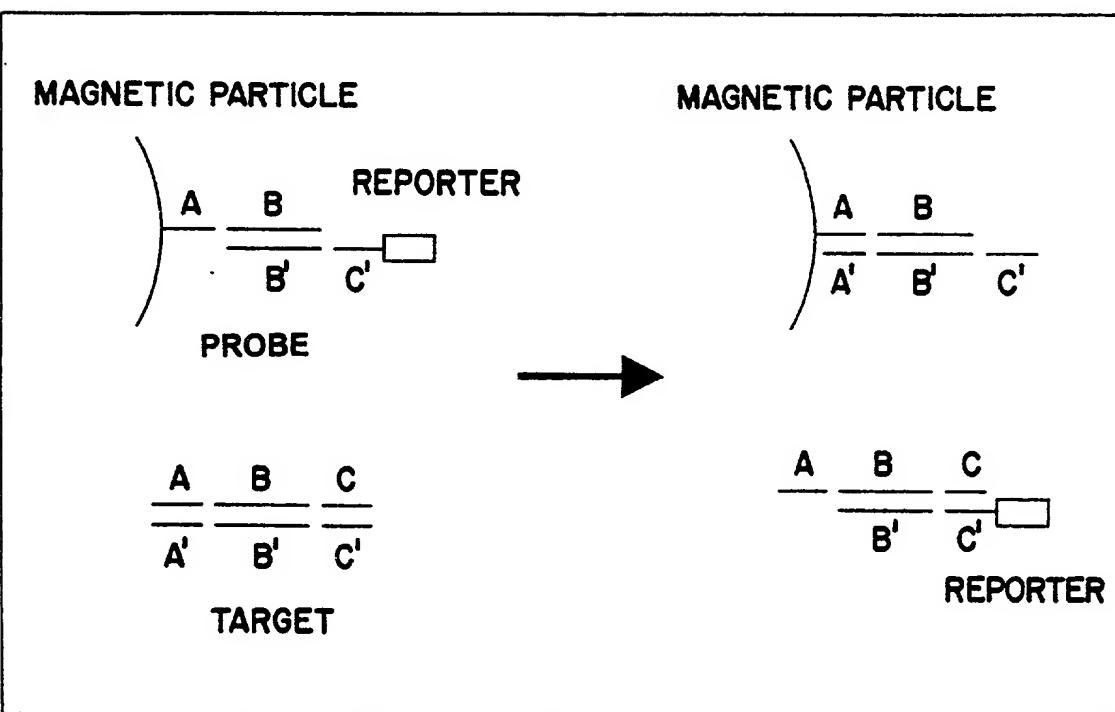
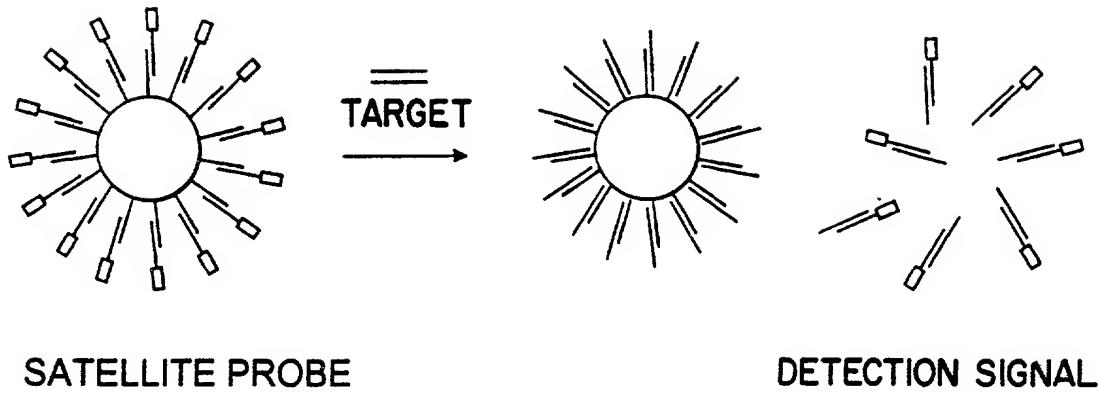


FIG. 25A

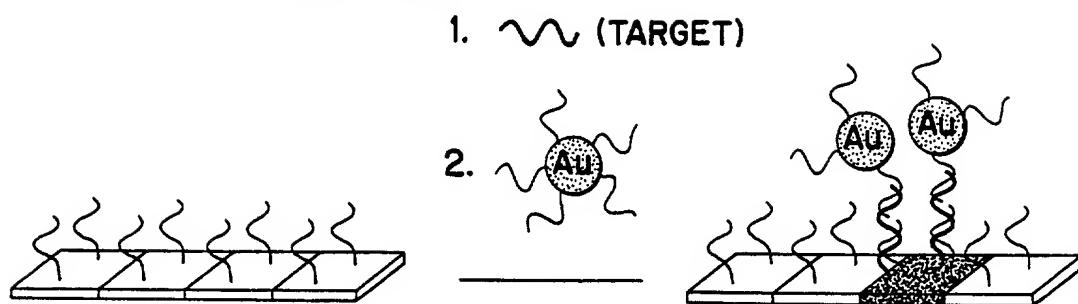


FIG. 25B

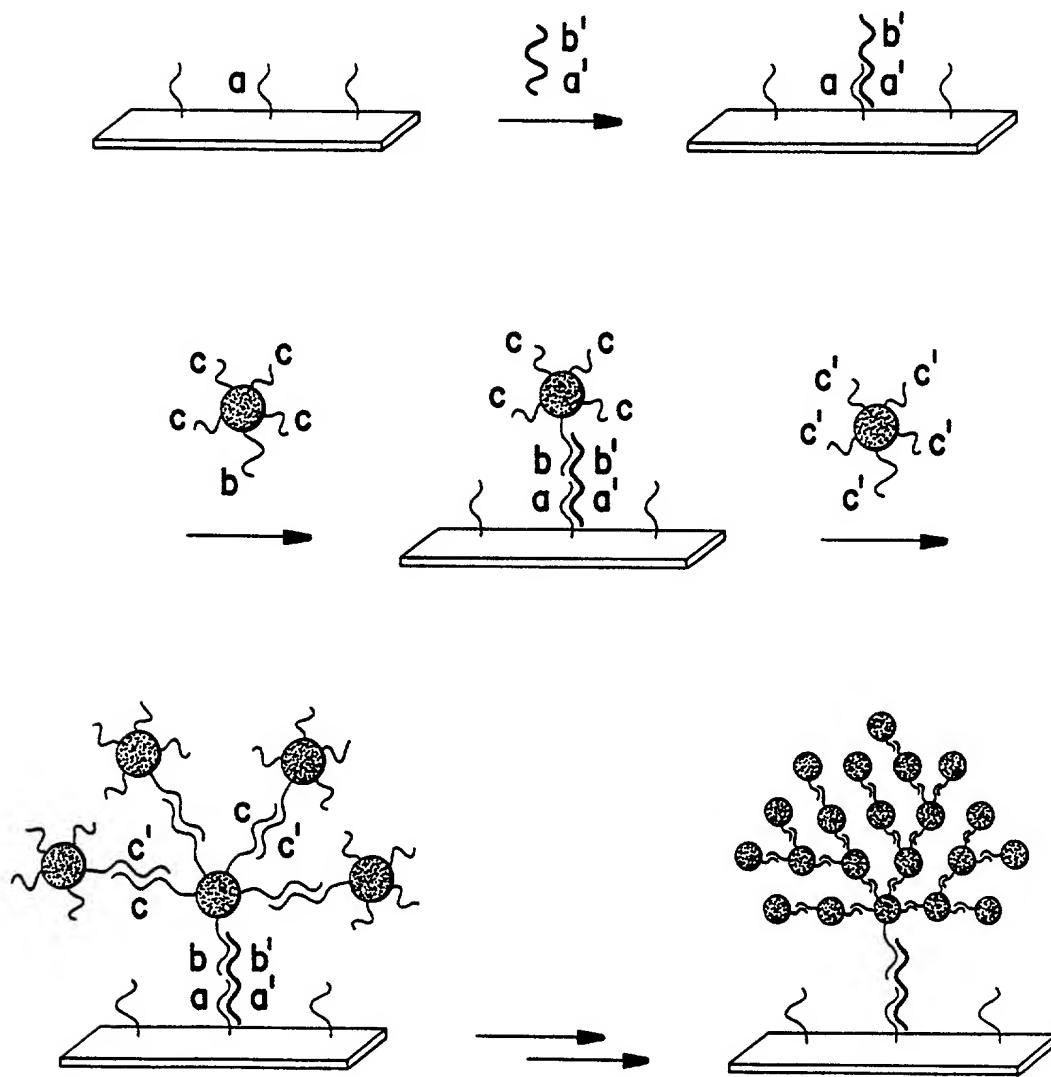


FIG. 26A

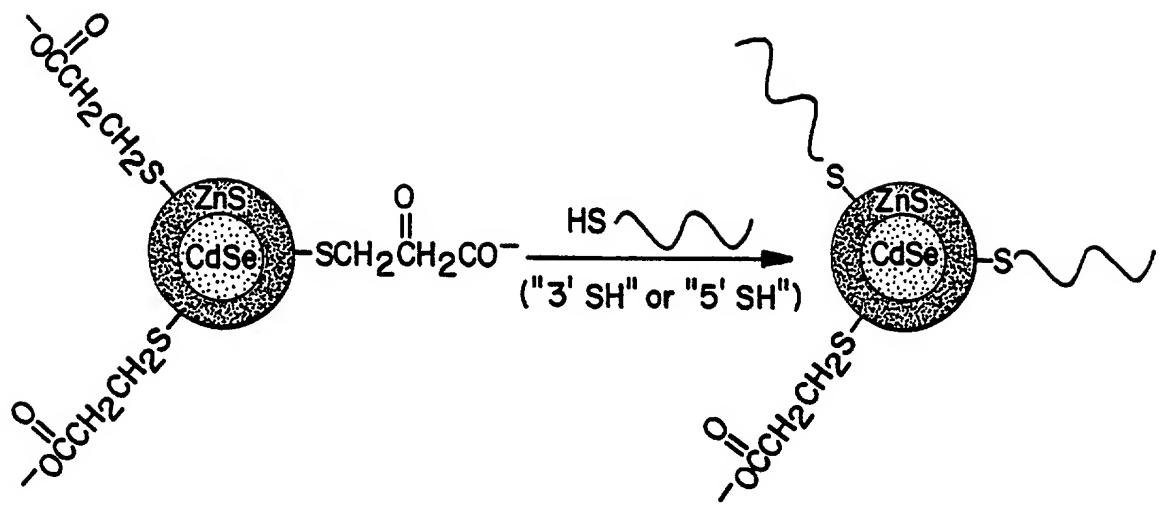


FIG. 26B

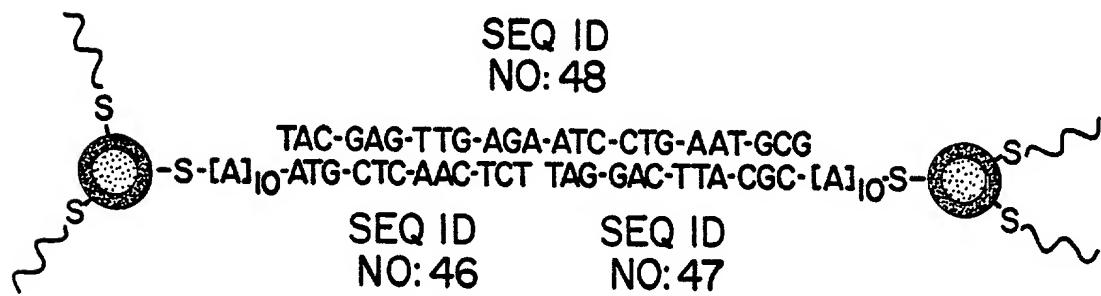


FIG. 27A

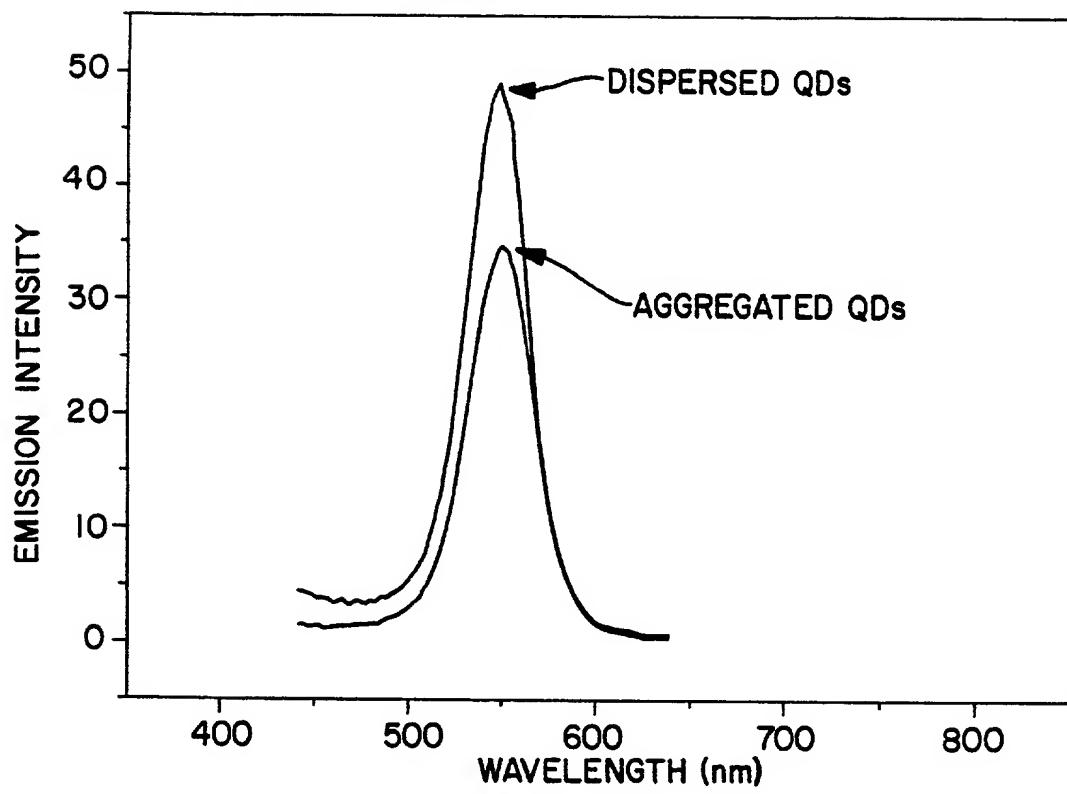


FIG. 27B

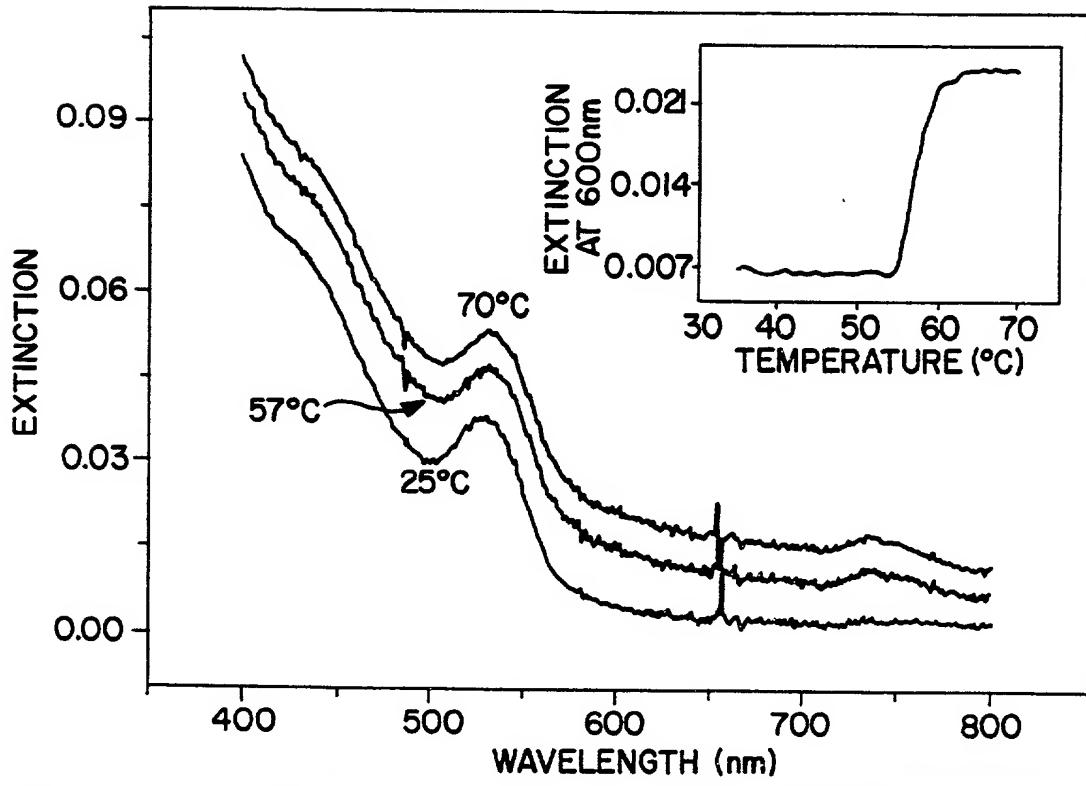


FIG. 27C

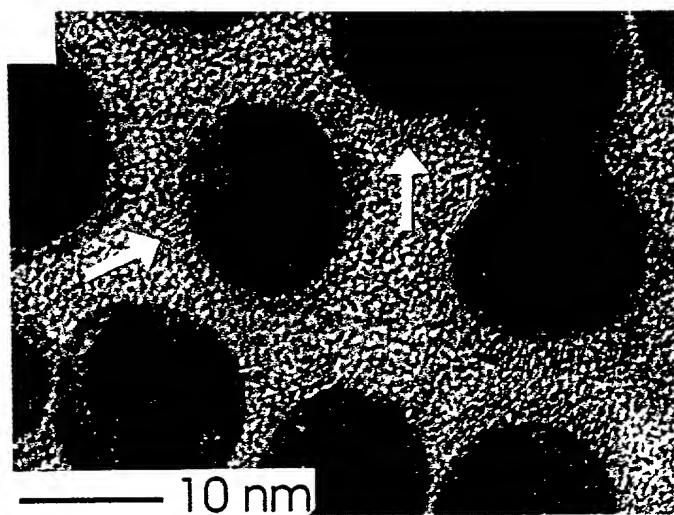
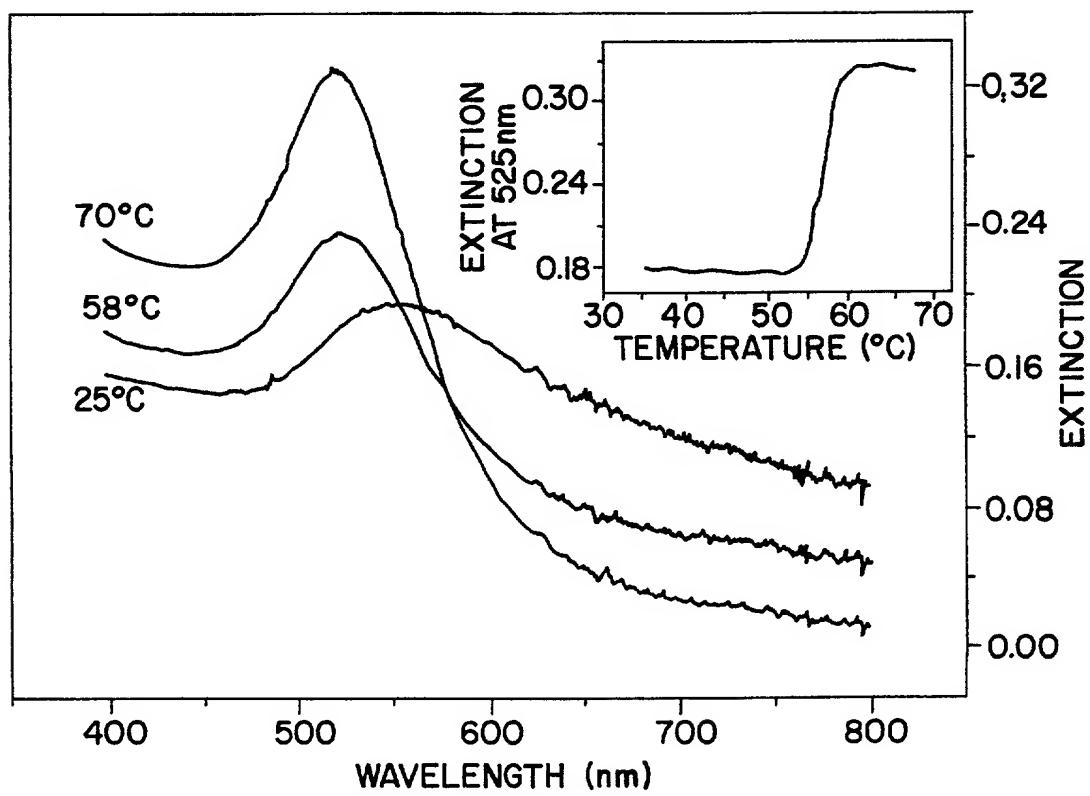


FIG. 27D



# FIG. 28A

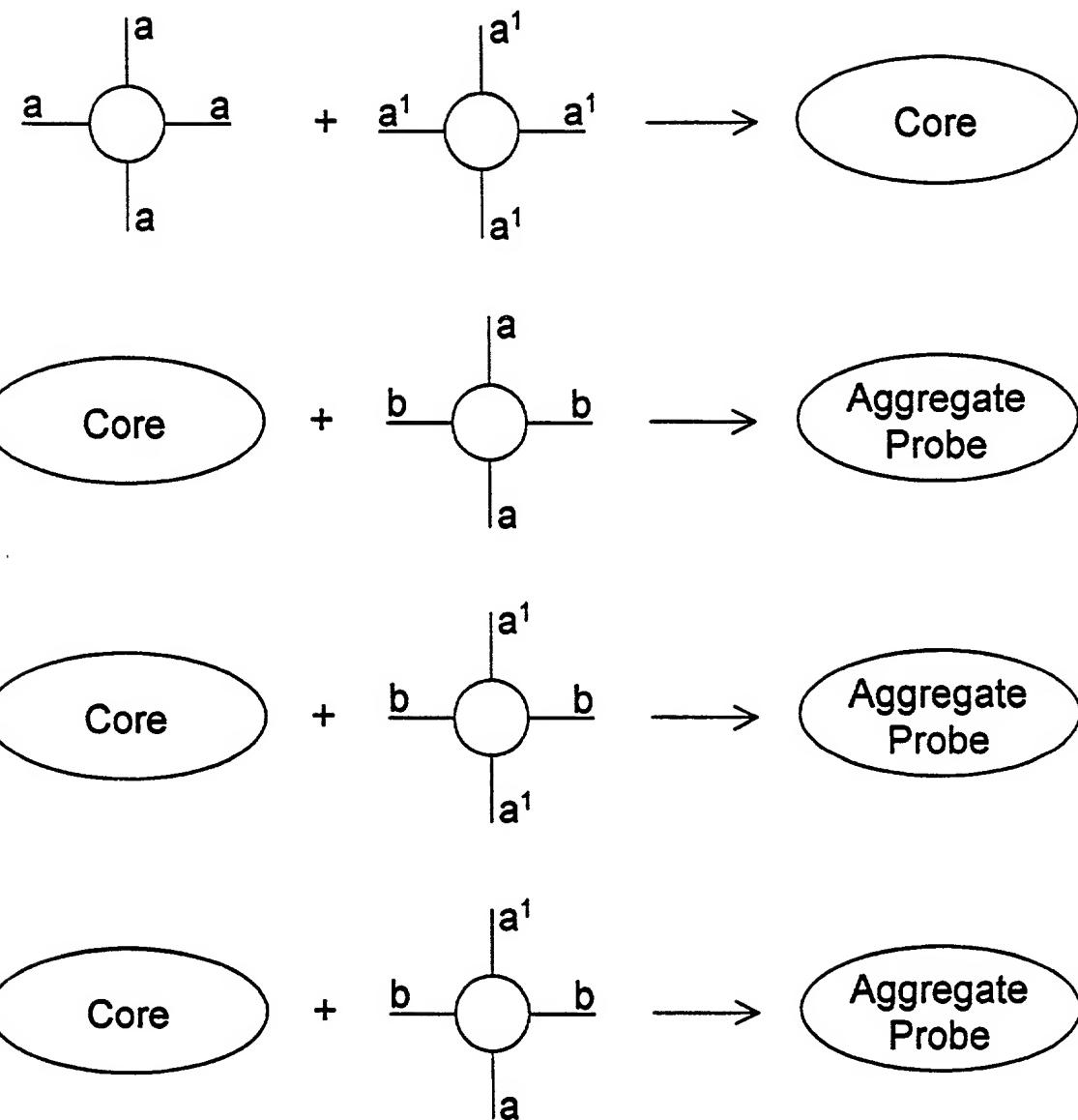


FIG. 28B

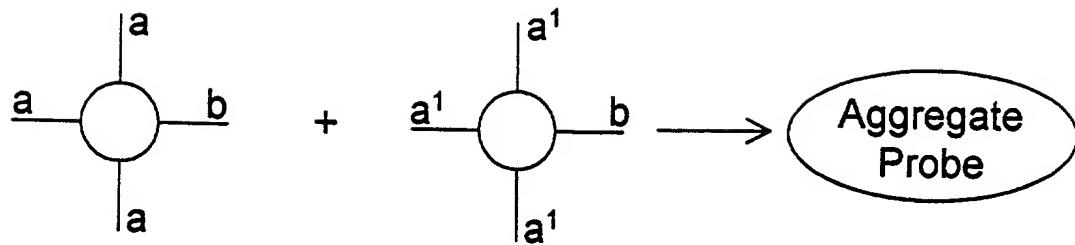


FIG. 28C

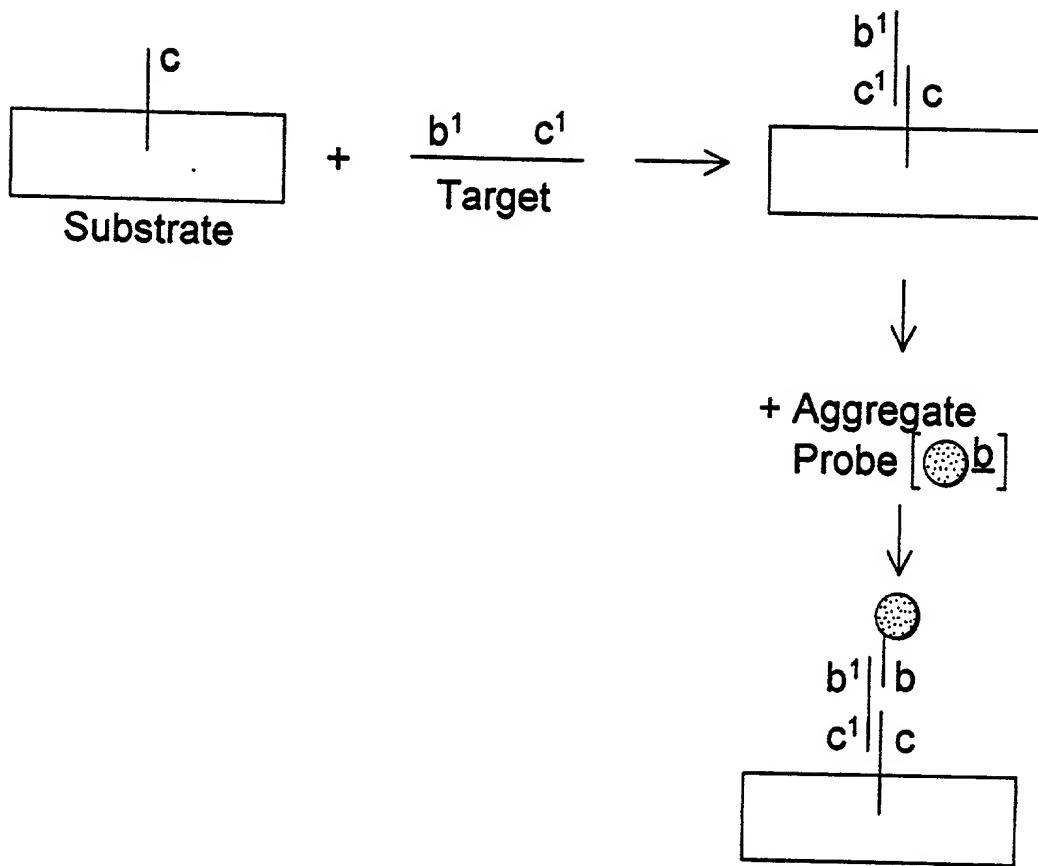


FIG. 28D

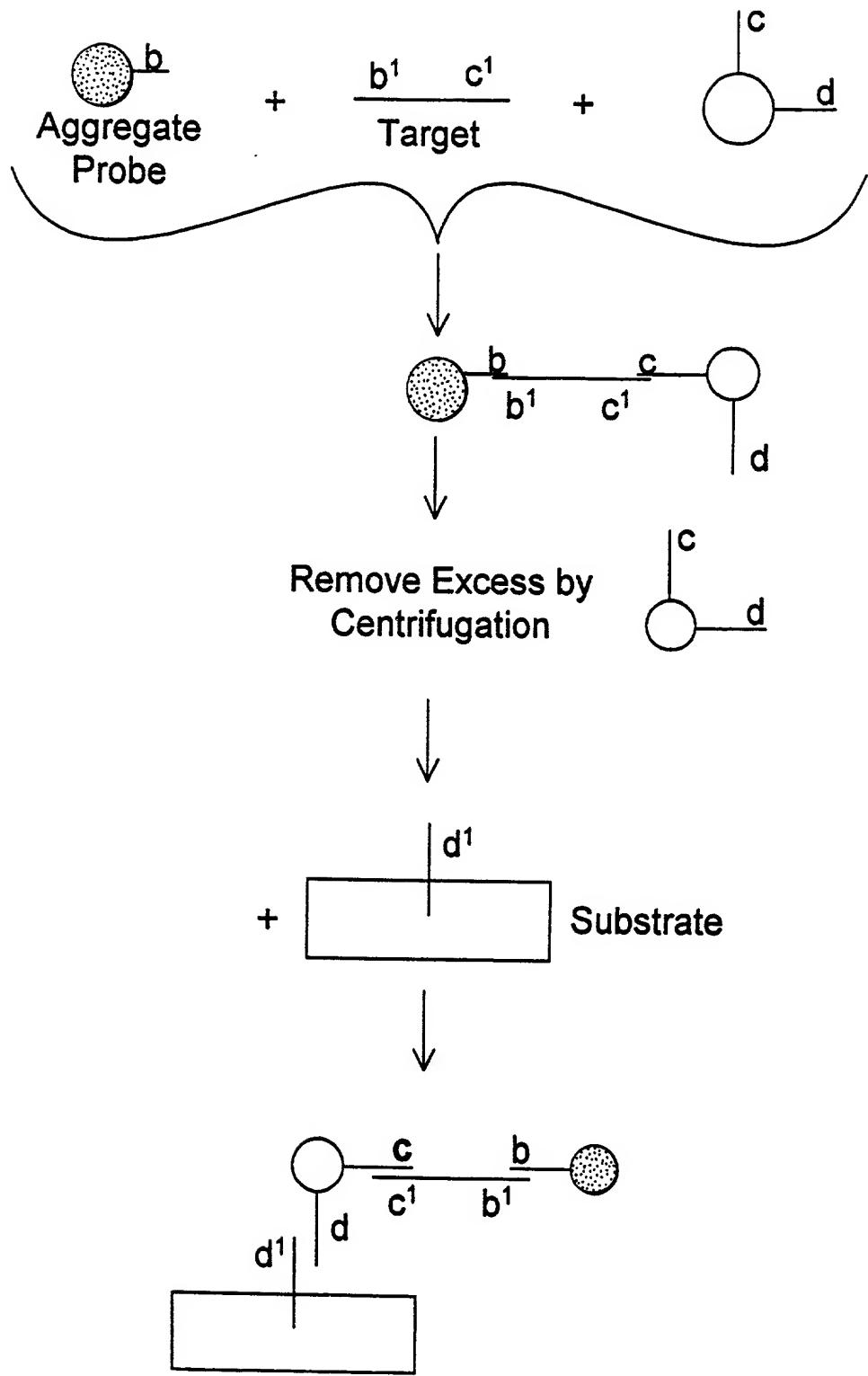
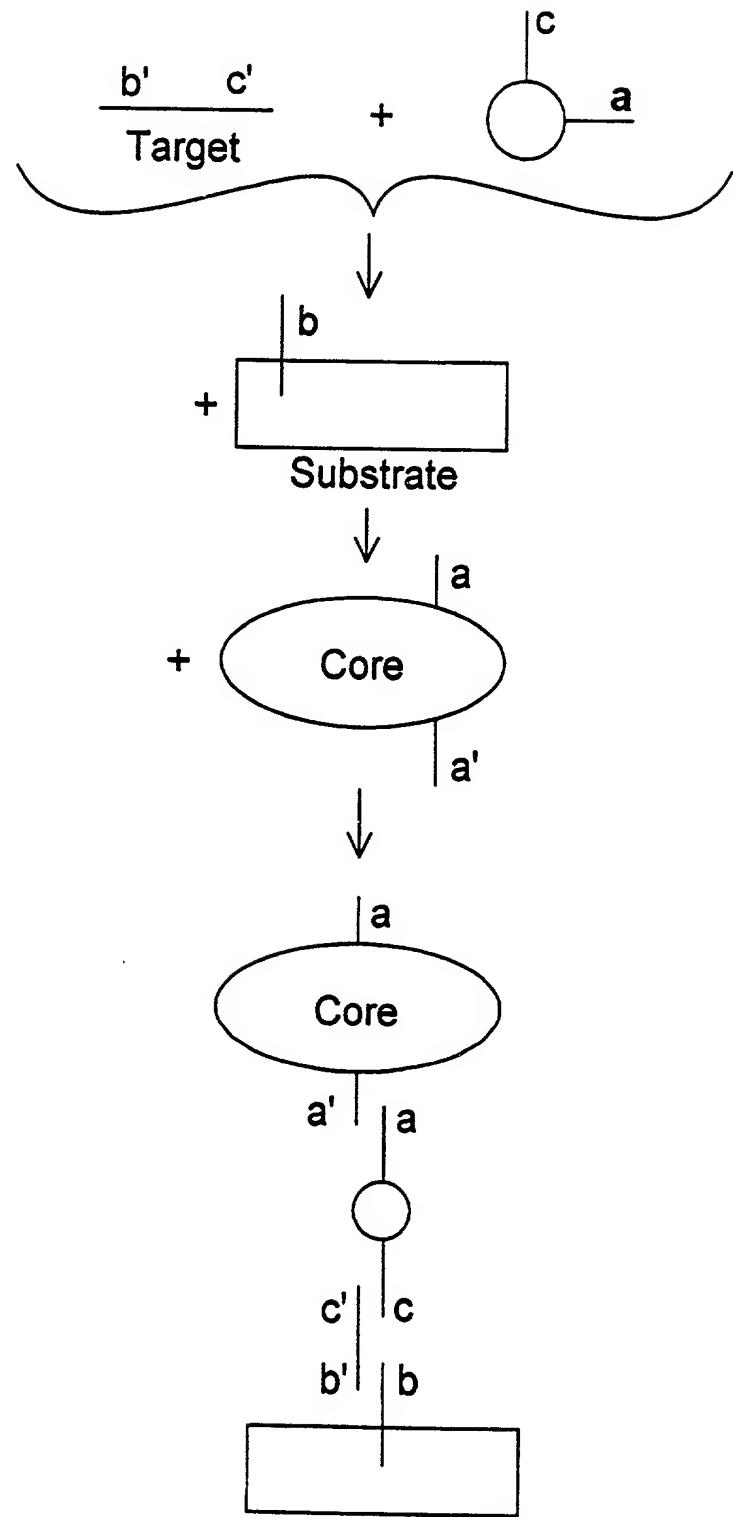
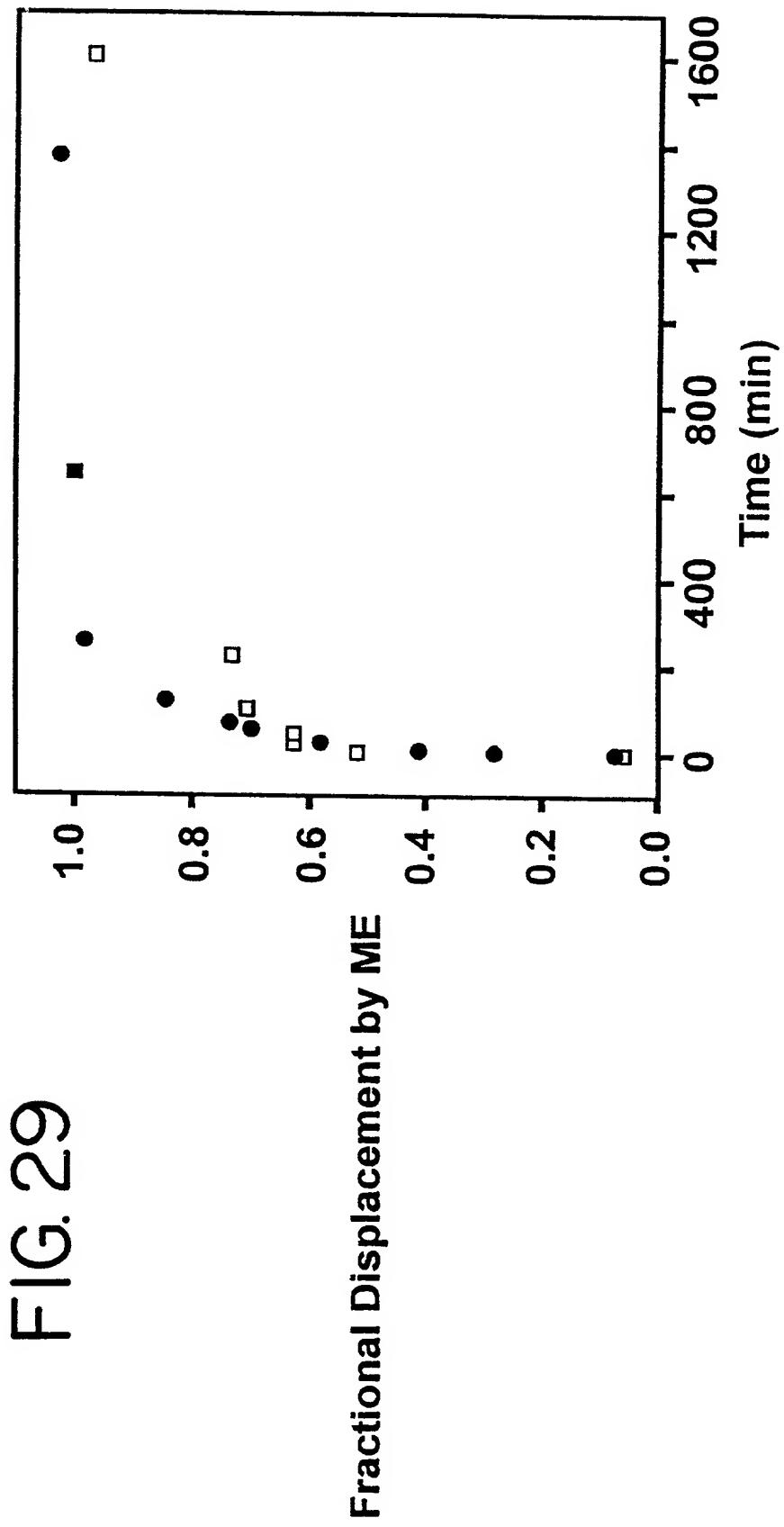


FIG. 28E





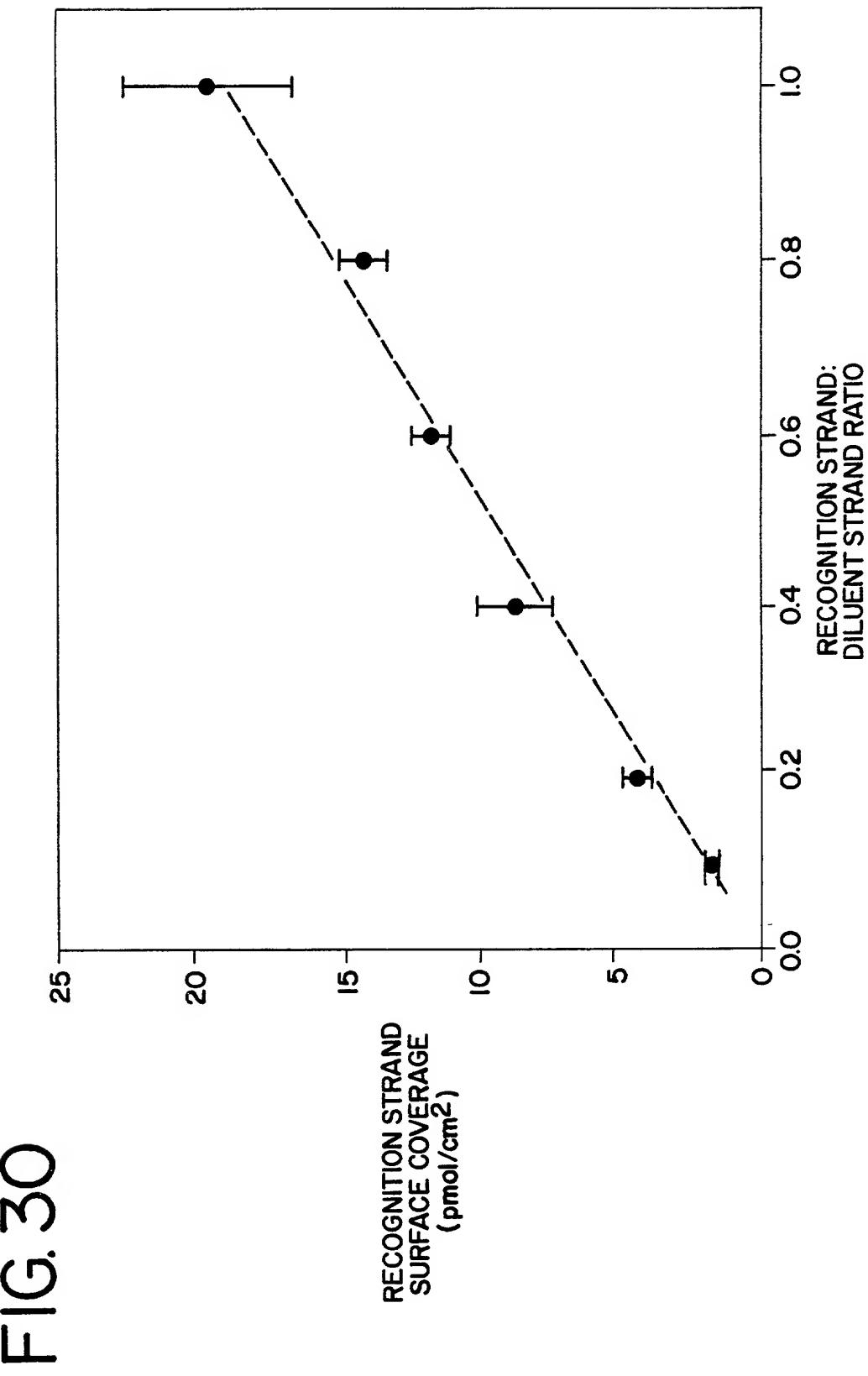
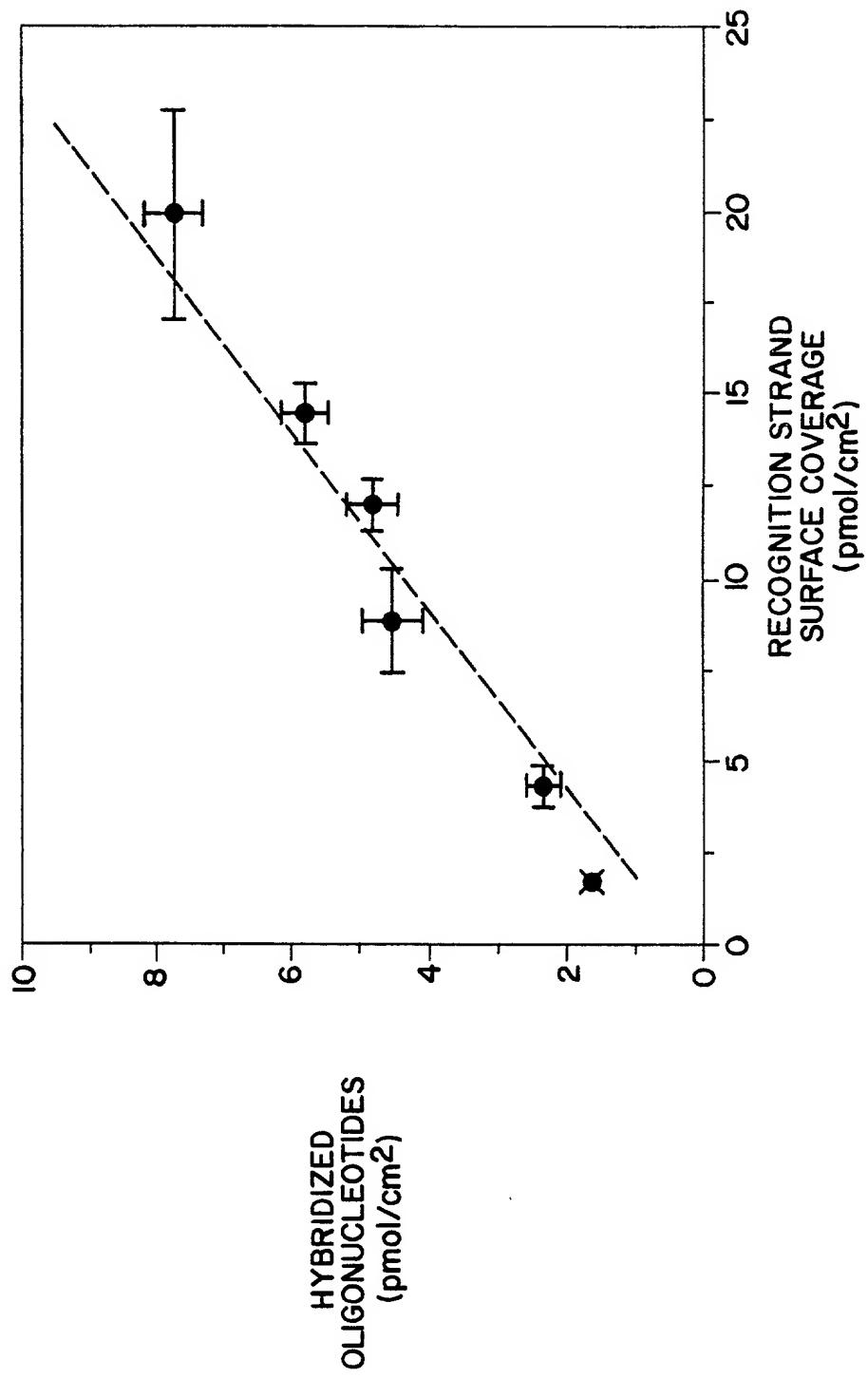
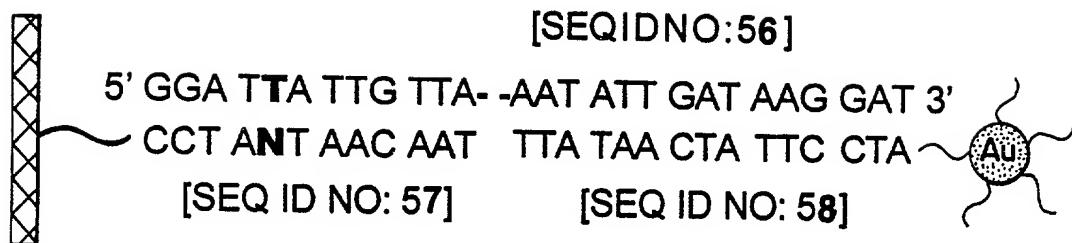


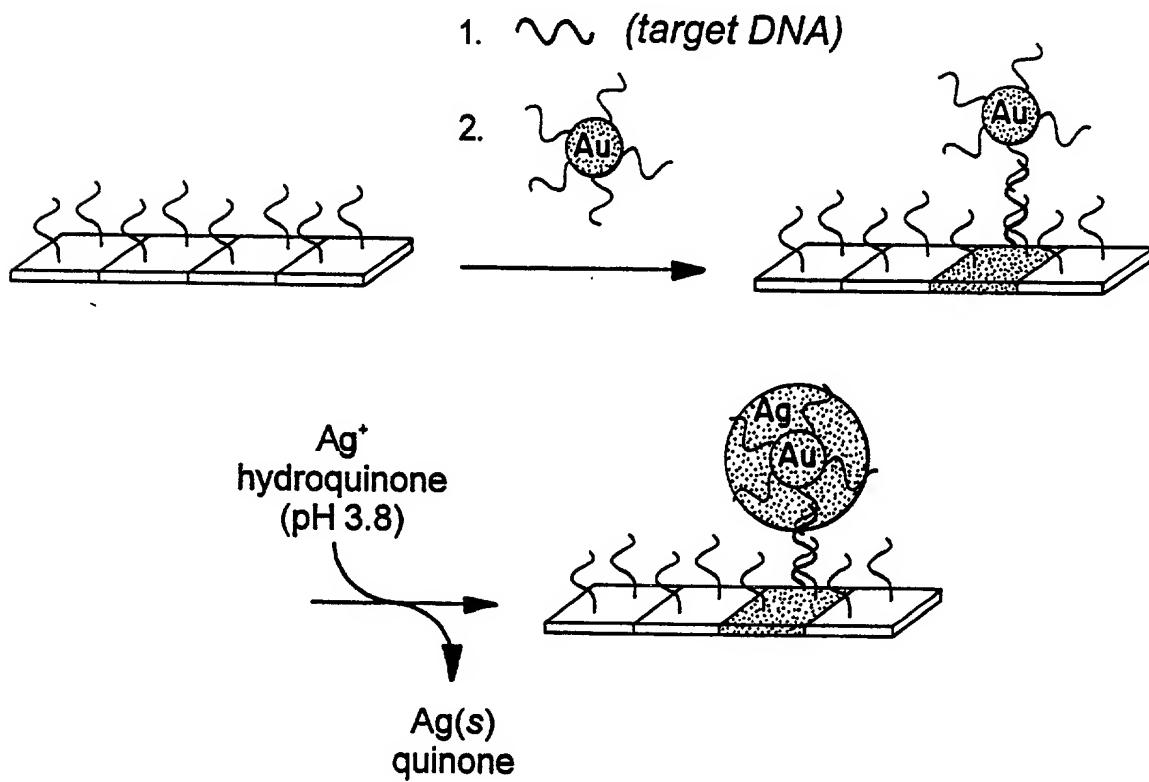
FIG. 3|



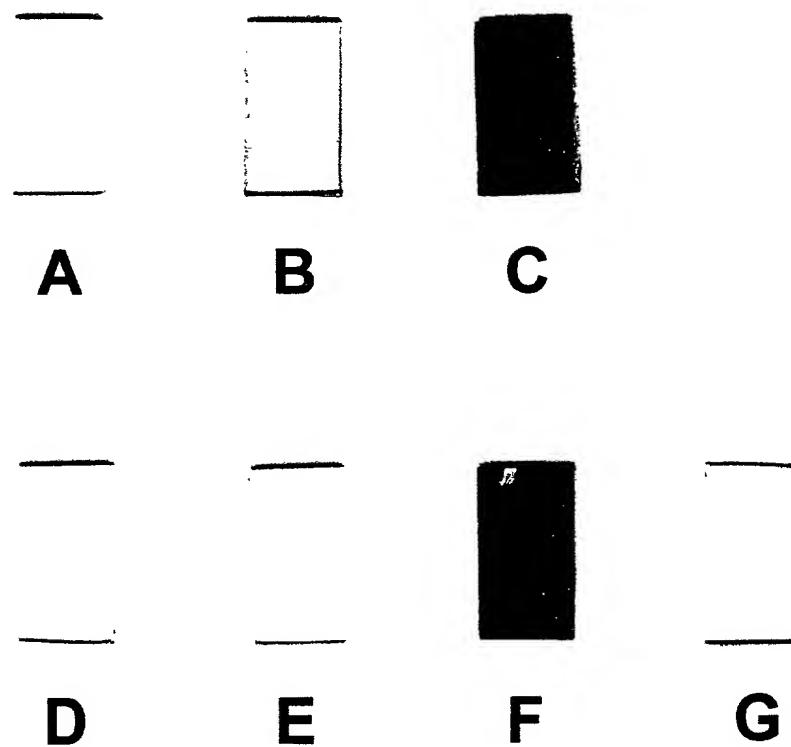
## FIG. 32



**N** = A (complementary),  
G,C,T (mismatched)



# FIG.33



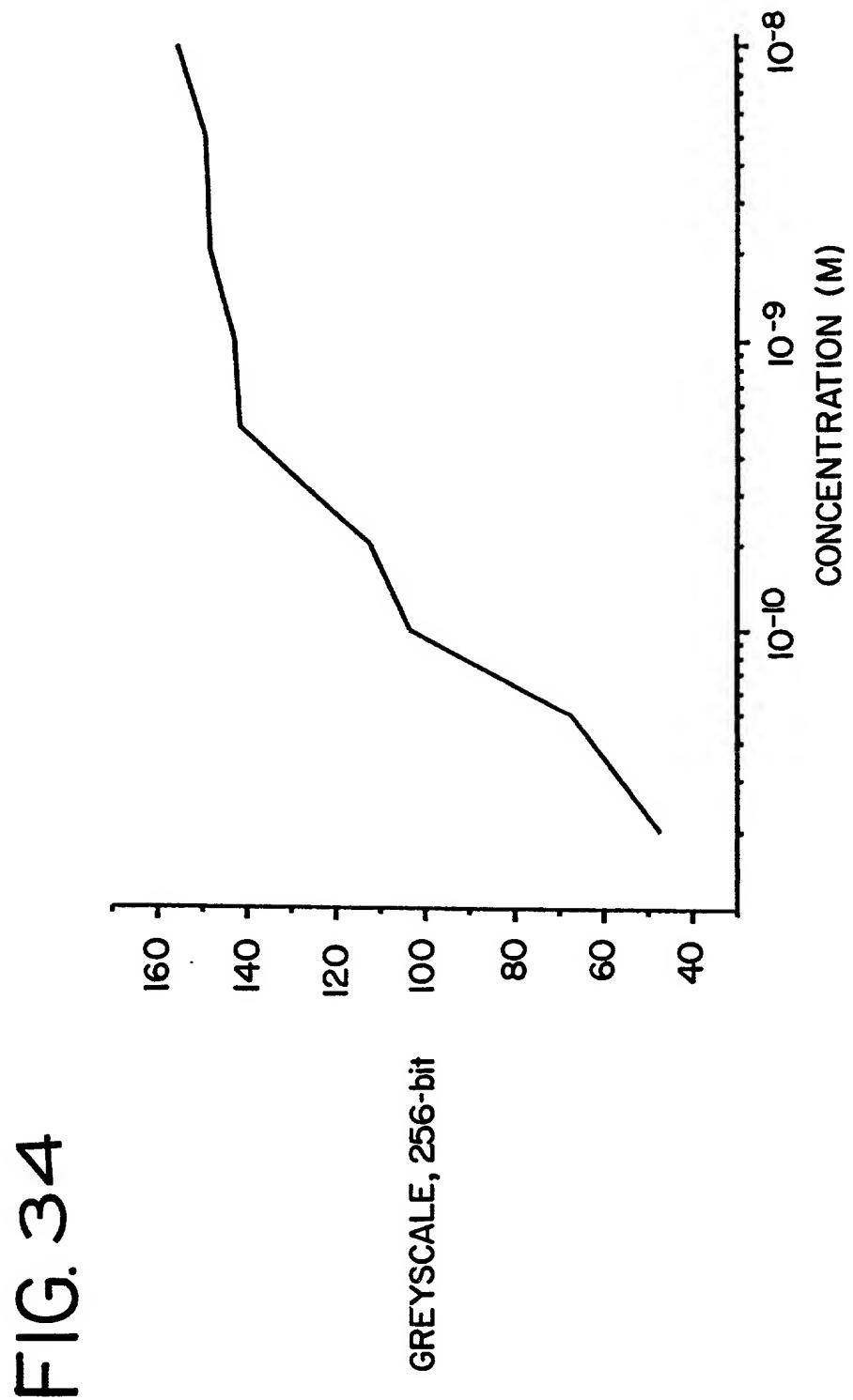


FIG.35A

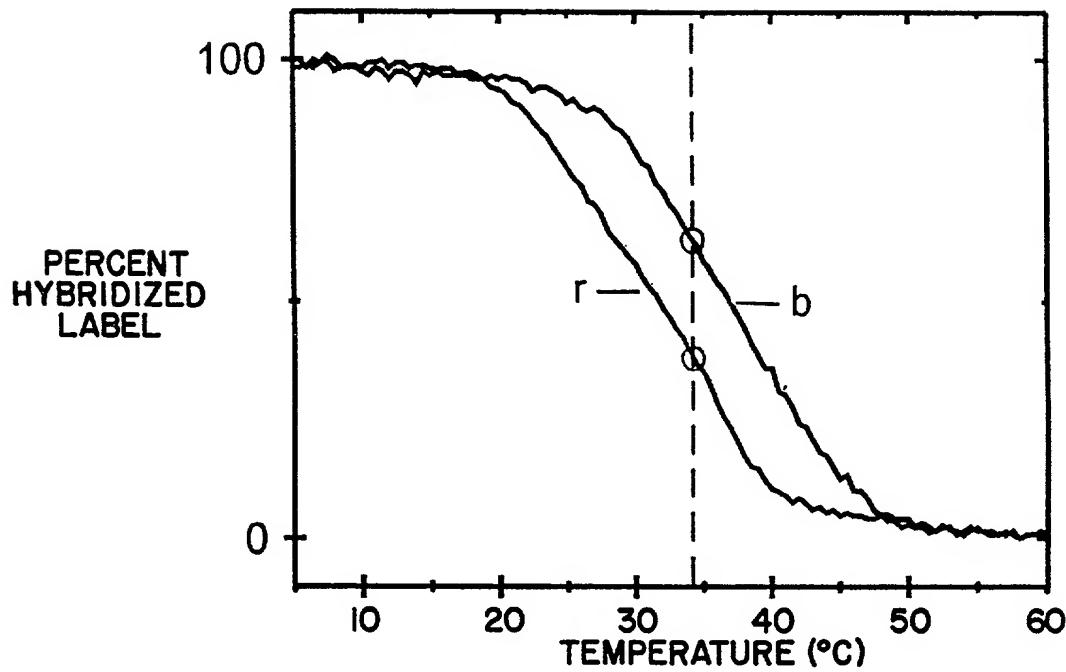


FIG.35B

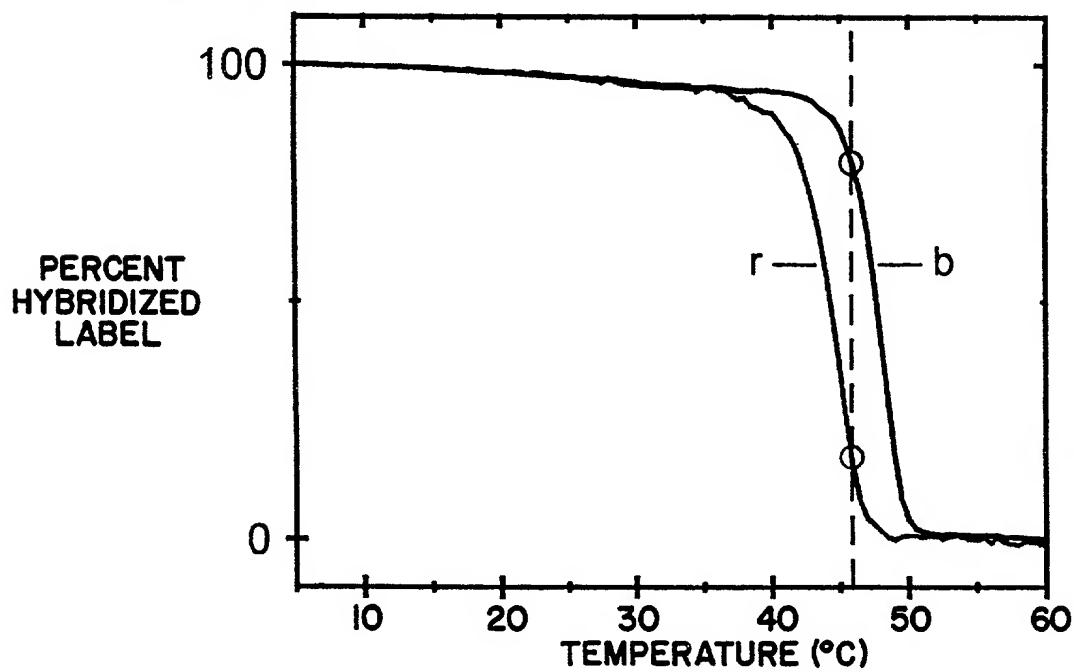


FIG. 36A

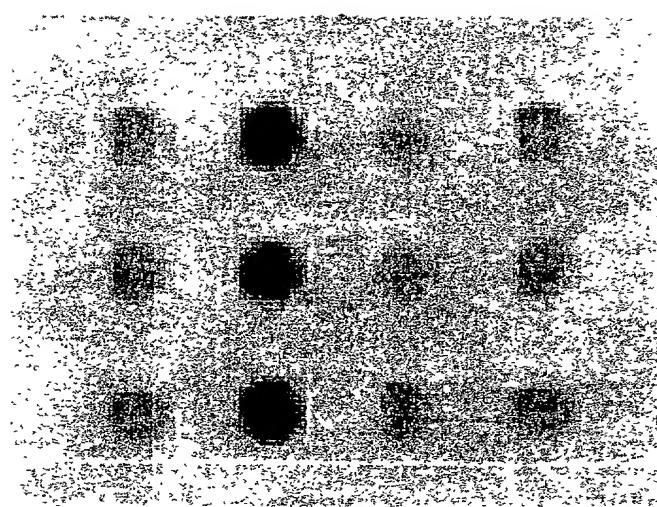
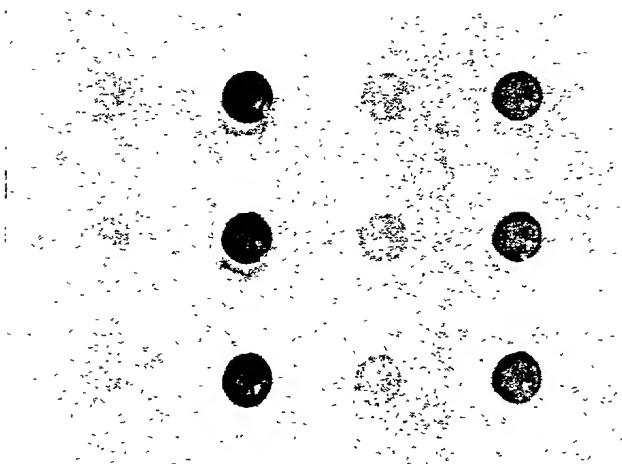


FIG. 36B



C A T G

FIG.37A

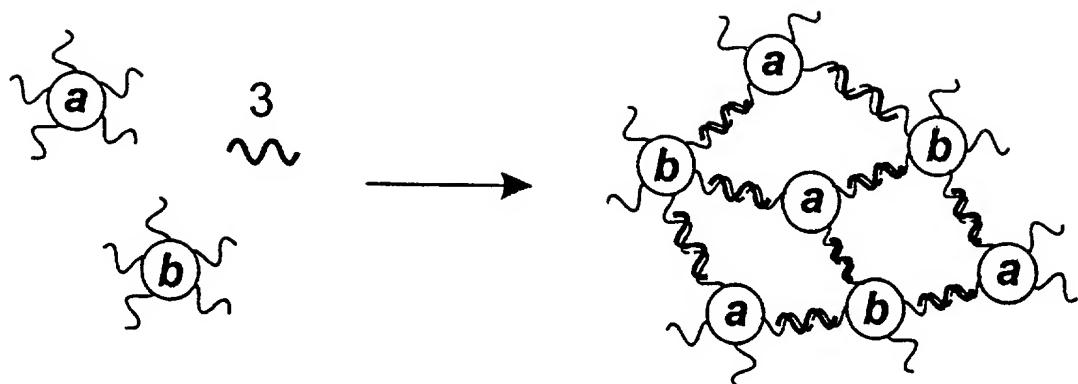
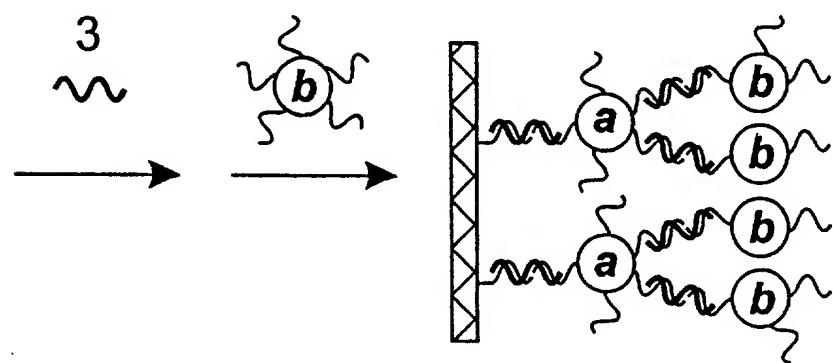
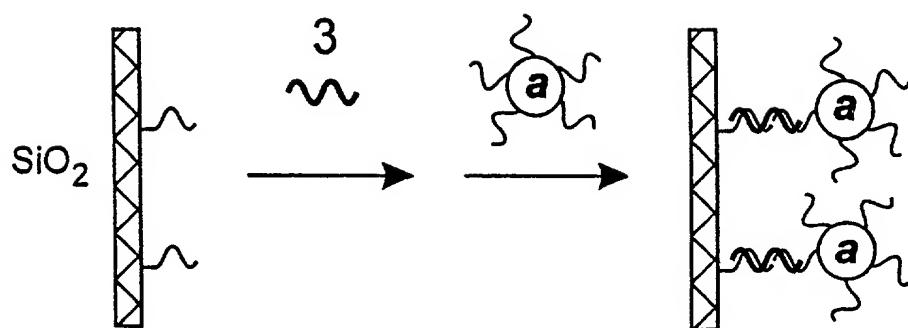
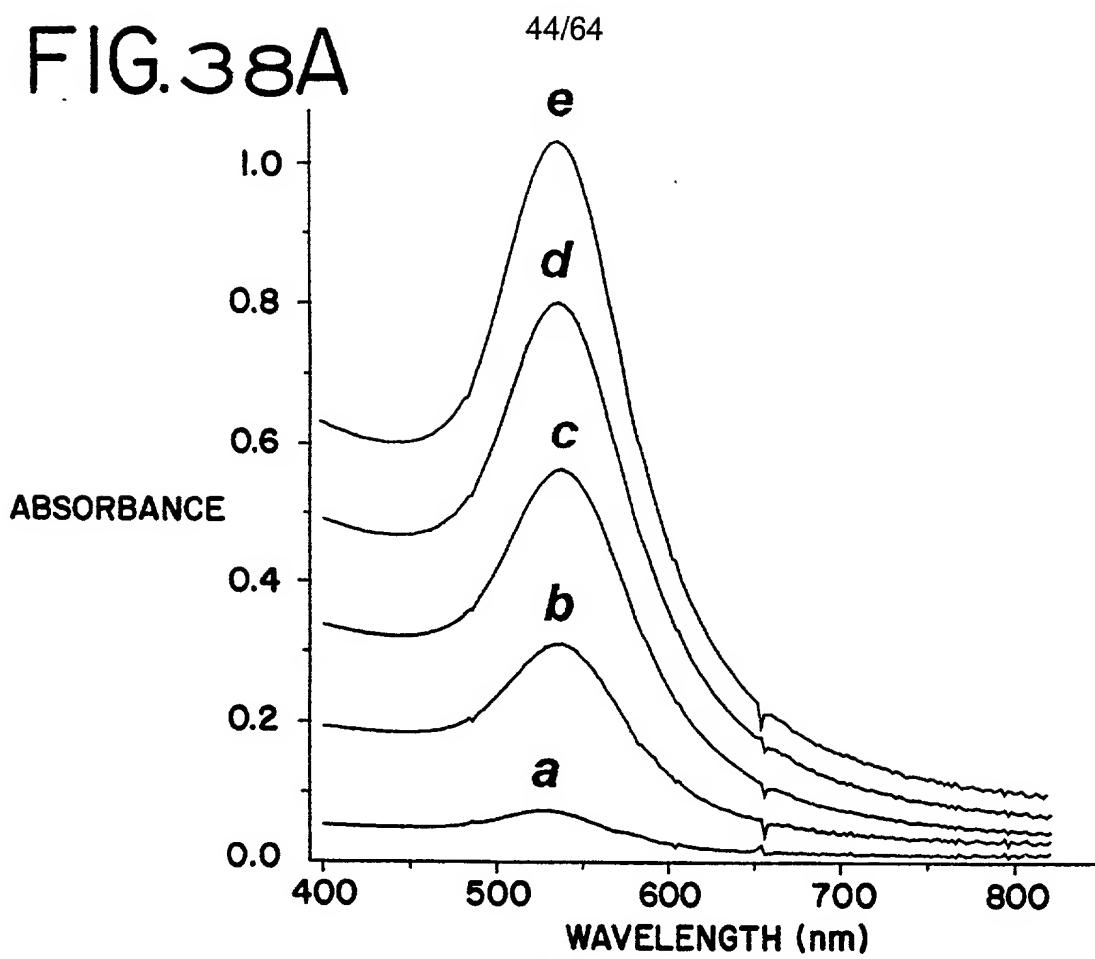


FIG.37B



**FIG. 38A**



**FIG. 38B**

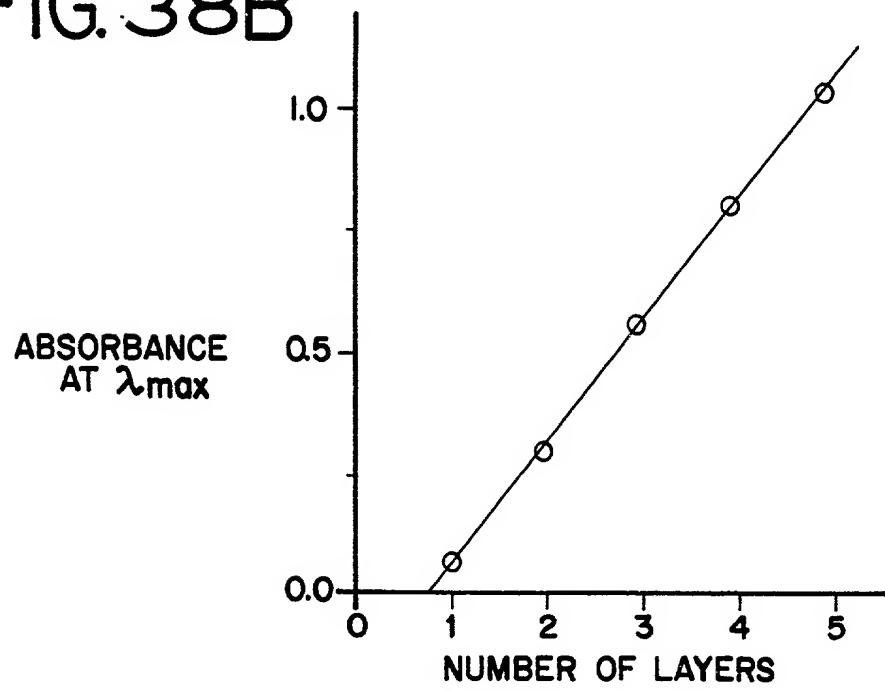


FIG.39A

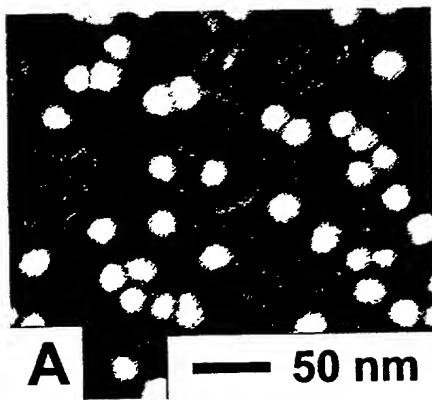
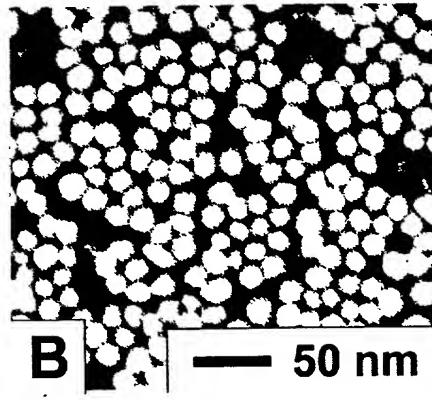


FIG.39B



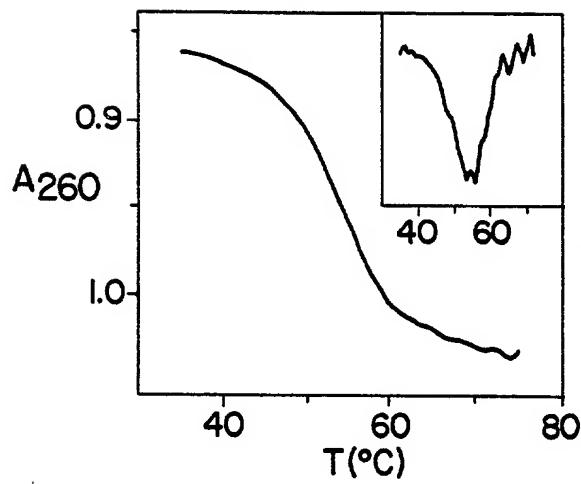
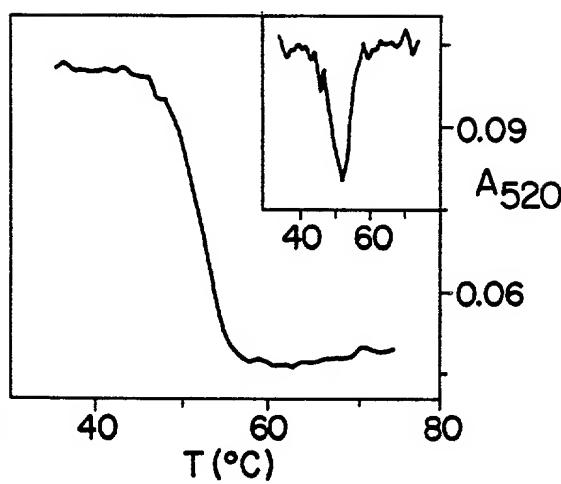
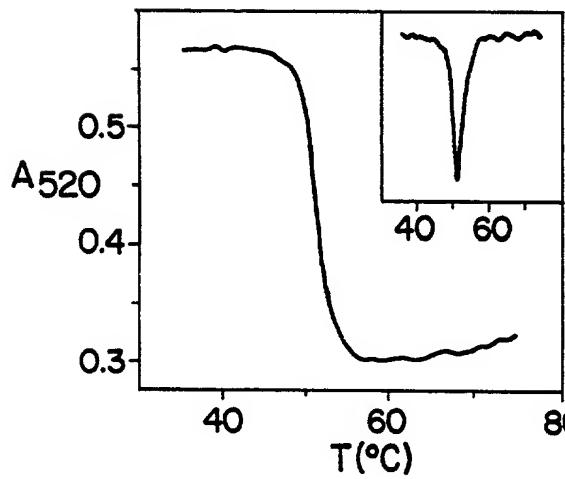
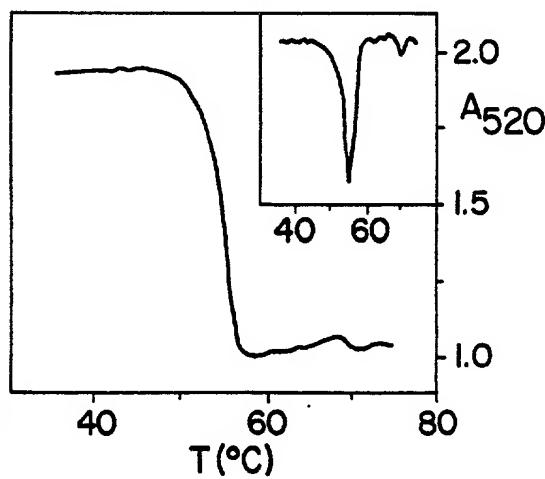
**FIG.39C****FIG.39D****FIG.39E****FIG.39F**

FIG. 40

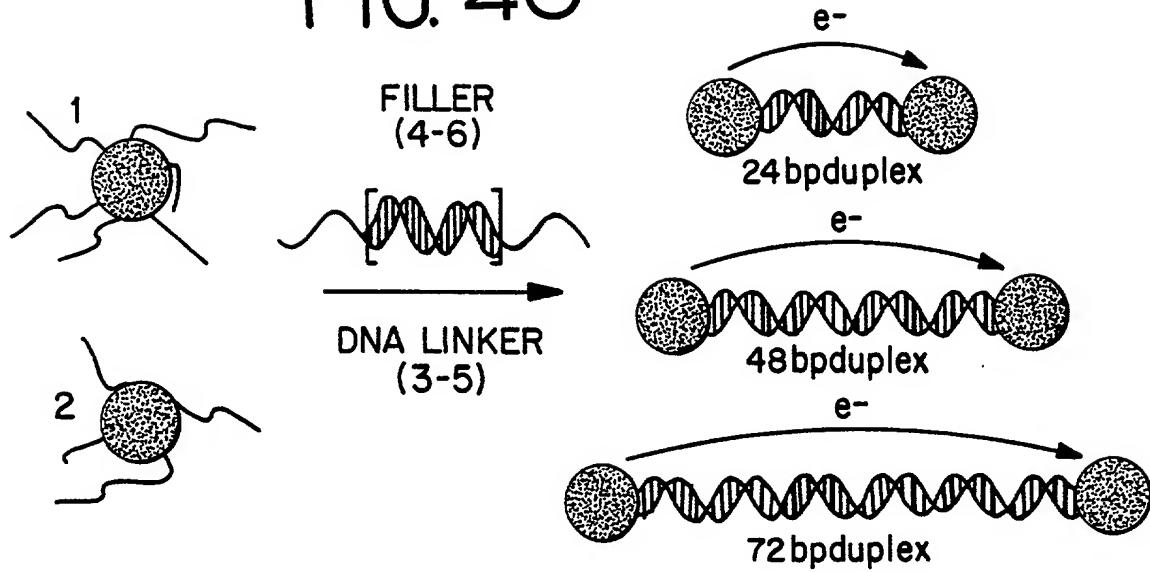
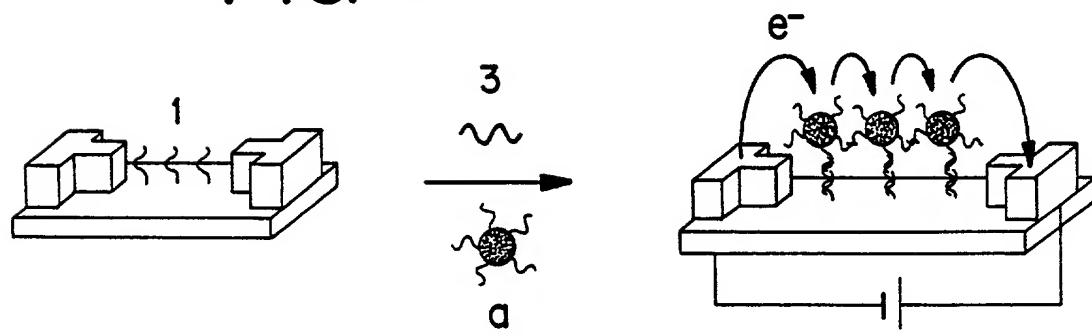
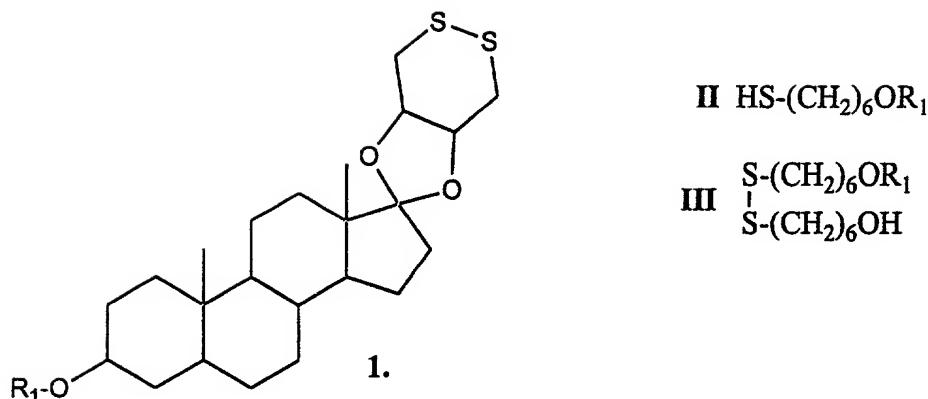


FIG. 41



## FIG. 42

 $R_1$ 

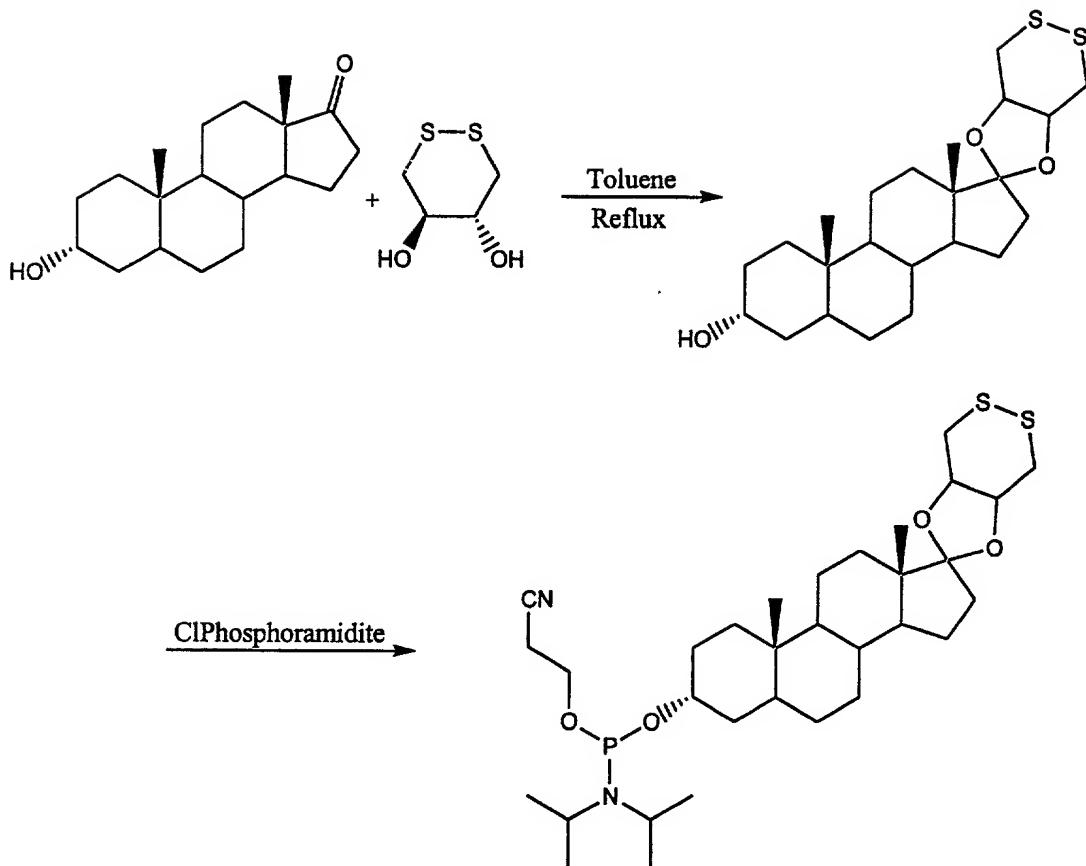
a = H

b = (iPr)<sub>2</sub>NP(OCH<sub>2</sub>CH<sub>2</sub>CN)-c1 = 5'-p(A<sub>20</sub>)-TATCGTTCCATCAGCT [SEQ ID NO: 65]c2 = 5'-p(A<sub>20</sub>)-TTGATCTTCCGTTCT [SEQ ID NO: 66]

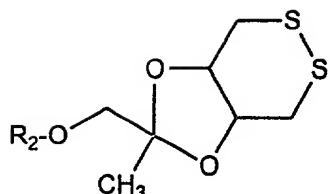
Target I = 79-mer oligonucleotide with target region:

3'-.....ATAGCAAGGTAGTCGAGCAACTAGAAAGGCAAGA.....5'  
 [SEQ ID NO: 67]

FIG. 43



## FIG. 44

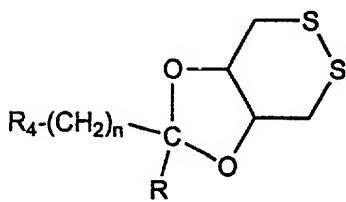


2.

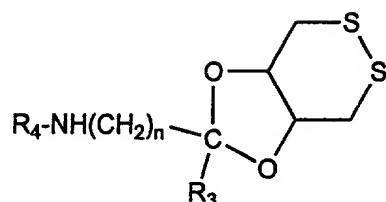
 $R_2$  $a = H$  $b = (iPr)_2NP(OCH_2CH_2CN)-$  $c1 = 5'-p(A_{20})-GCAGACCTCA$  [SEQ ID NO: 68] $c2 = 5'-p(A_{20})-CCTATGTGTCG$  [SEQ ID NO: 69] $D = 5'-p(A_{20})$  [SEQ ID NO: 70]

Target I = 63-mer oligonucleotide with target region:

3'-.....CGTCTGGAGTGGATACACAGC.....5'  
[SEQ ID NO: 71]



3.



4.

 $R_3$  = hydrogen, an alkyl group, an aryl group, or a substituted alkyl or aryl group $R_4$  = an attached oligonucleotide or modified oligonucleotide

## FIG. 45

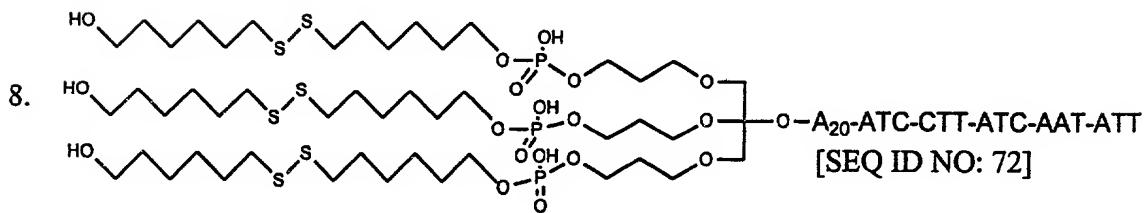
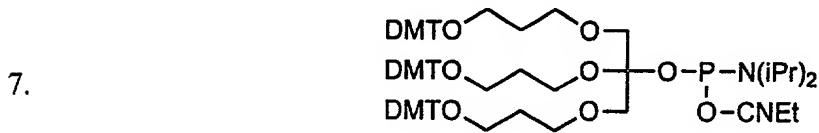
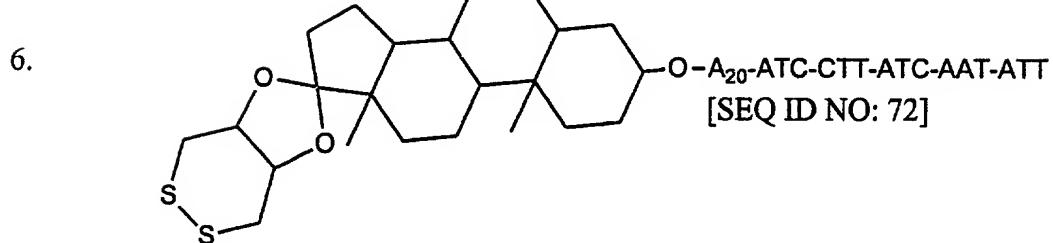
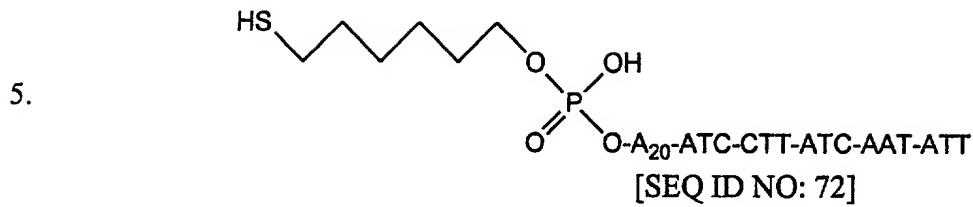
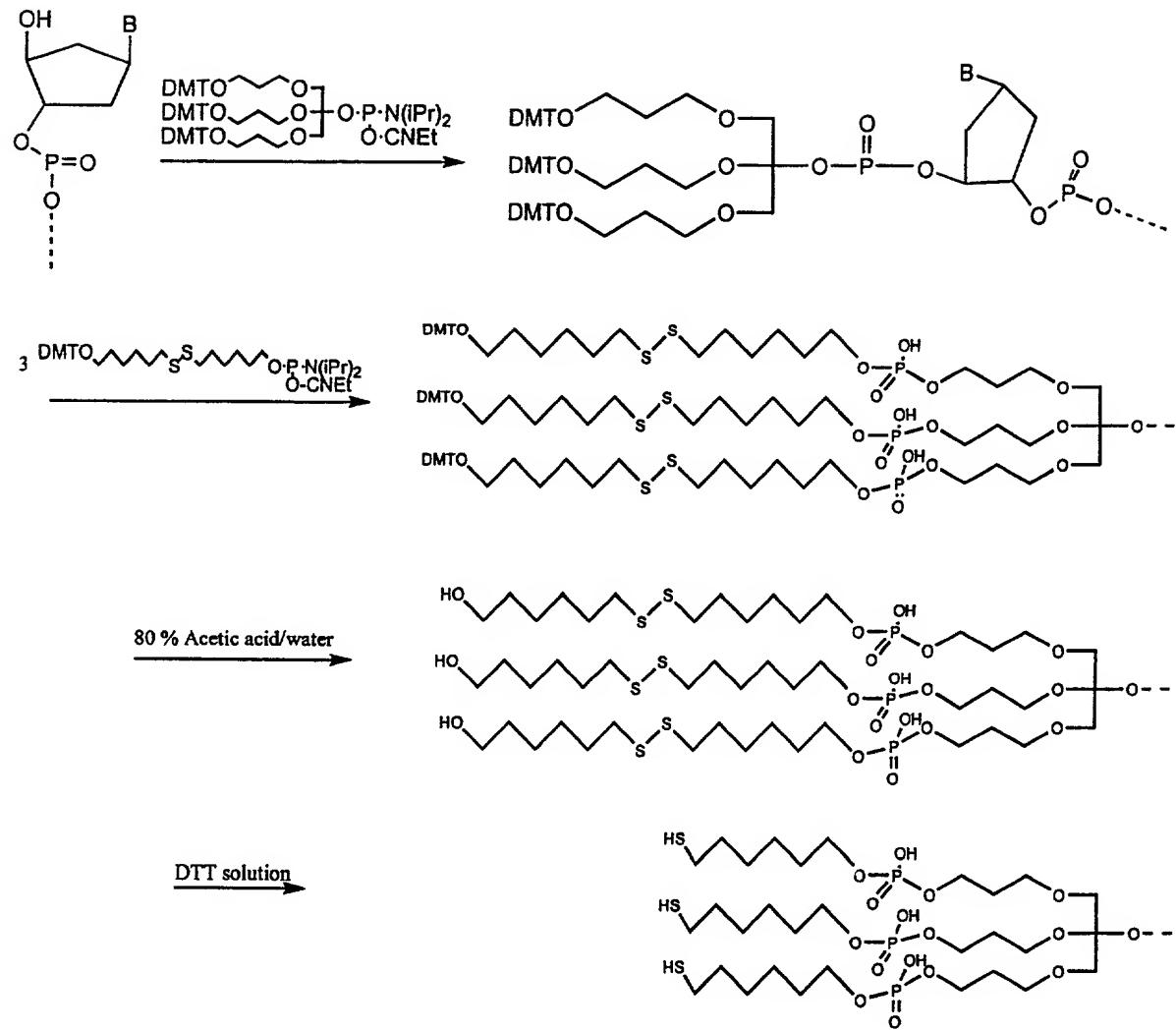


FIG. 46



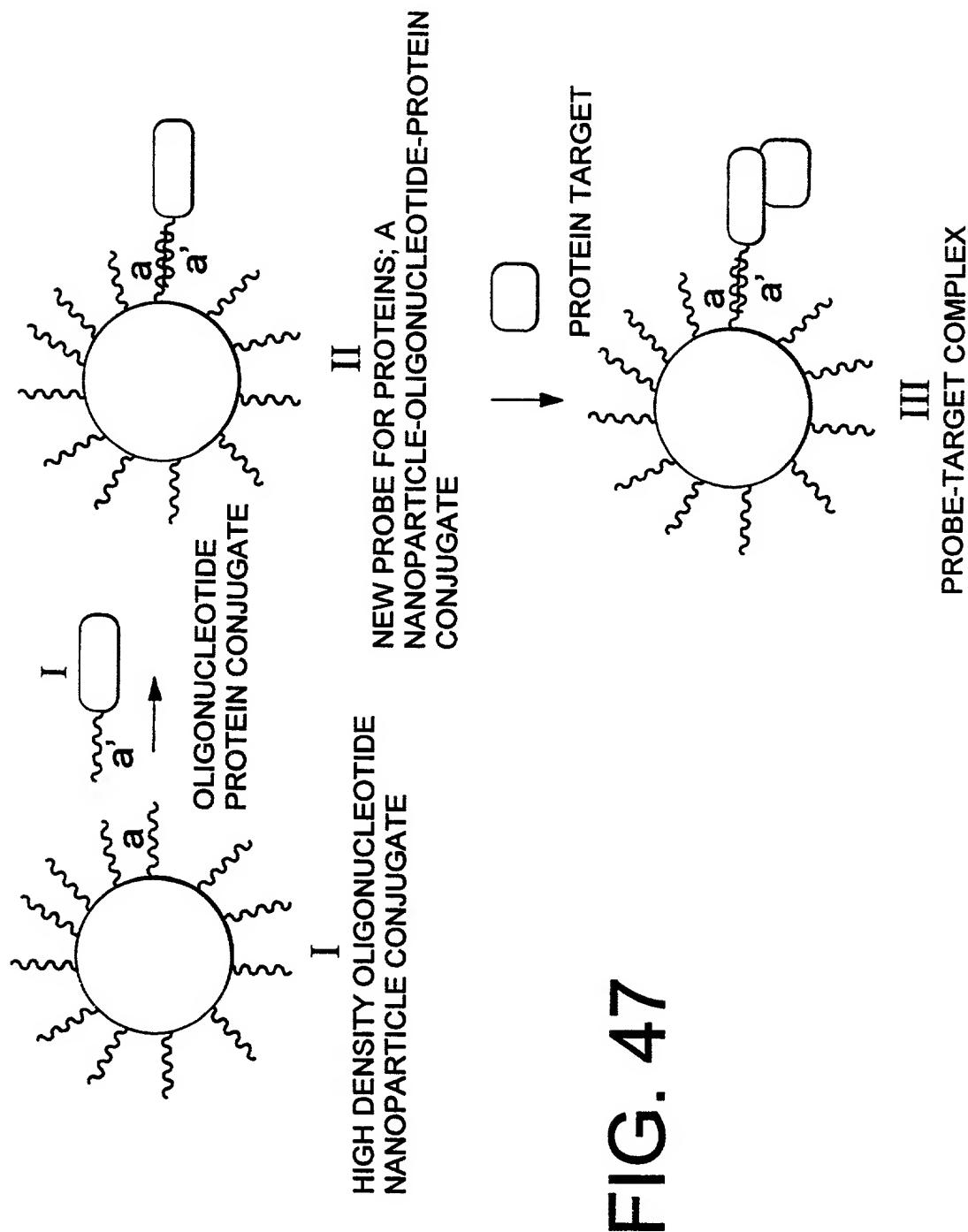
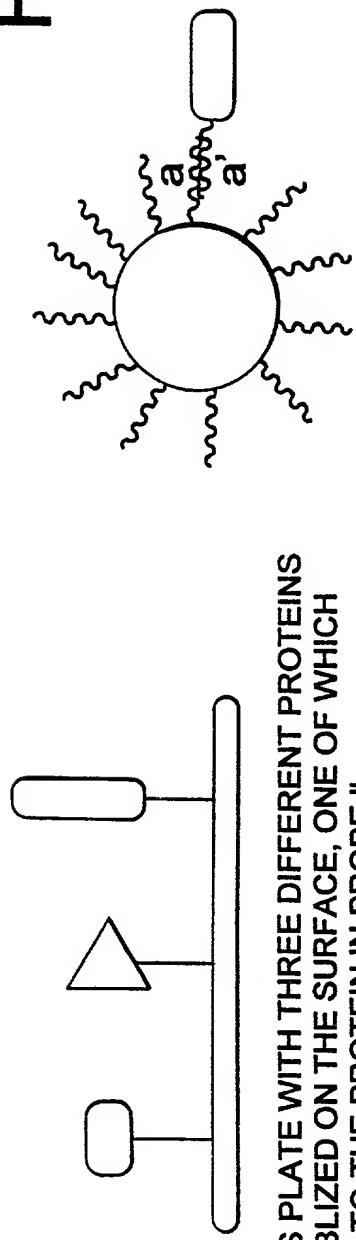


FIG. 48

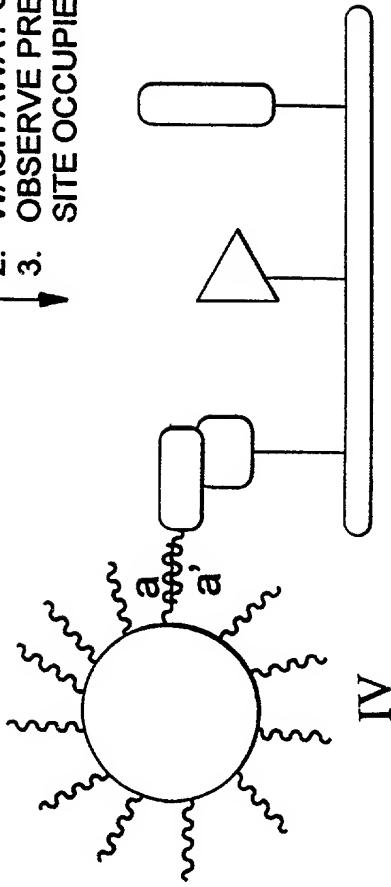


GLASS PLATE WITH THREE DIFFERENT PROTEINS  
IMMOBILIZED ON THE SURFACE, ONE OF WHICH  
BINDS TO THE PROTEIN IN PROBE II

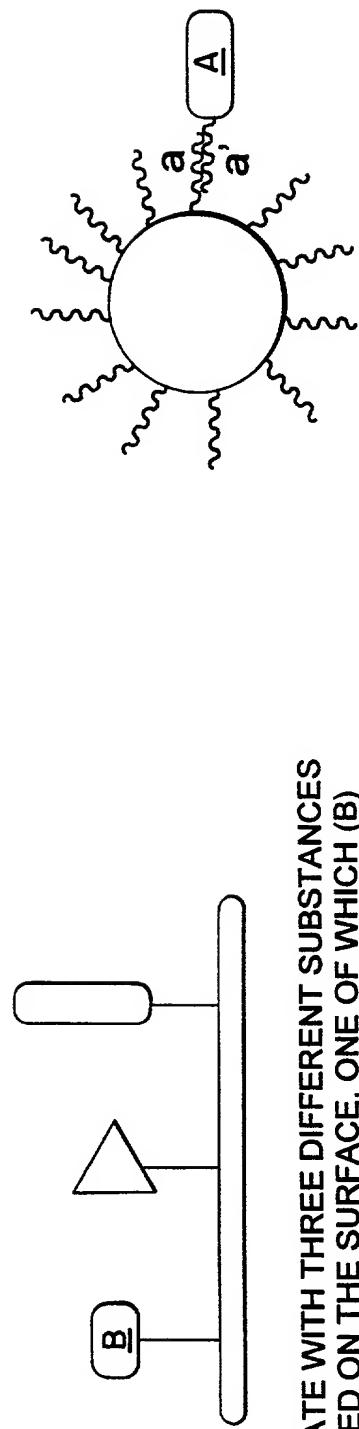
II

NEW PROBE FOR PROTEINS; A  
NANOPARTICLE-OLIGONUCLEOTIDE-PROTEIN  
CONJUGATE

1. EXPOSE PLATE TO THE PROBE SOLUTION
2. WASH AWAY UNBOUND NANOPARTICLE PROBE
3. OBSERVE PRESENCE OF BOUND NANOPARTICLES AT  
SITE OCCUPIED BY THE FIRST PROTEIN IN THE SERIES.

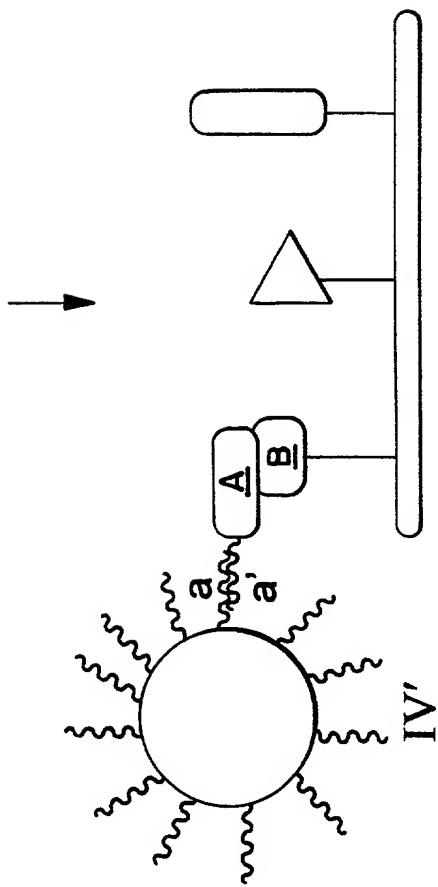


IV



GLASS PLATE WITH THREE DIFFERENT SUBSTANCES  
IMMOBILIZED ON THE SURFACE, ONE OF WHICH (B)  
BINDS TO THE RECEPTOR UNIT (A) IN II'

**II'**  
NANOPARTICLE-OLIGONUCLEOTIDE-RECEPTOR



**FIG. 49**

FIG. 50A

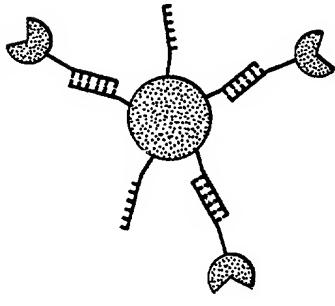


FIG. 51A

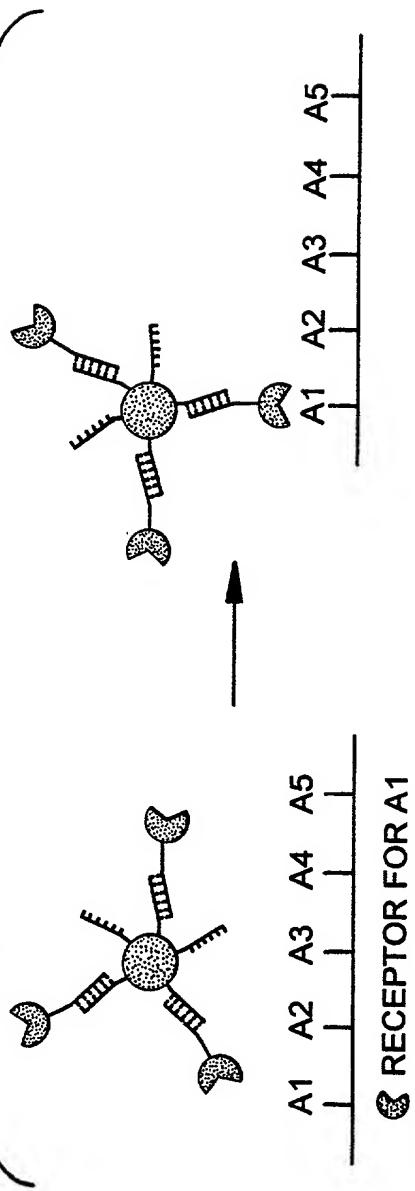


FIG. 50B

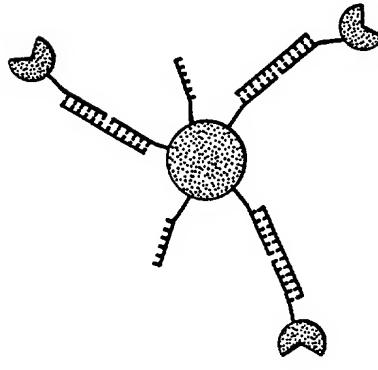
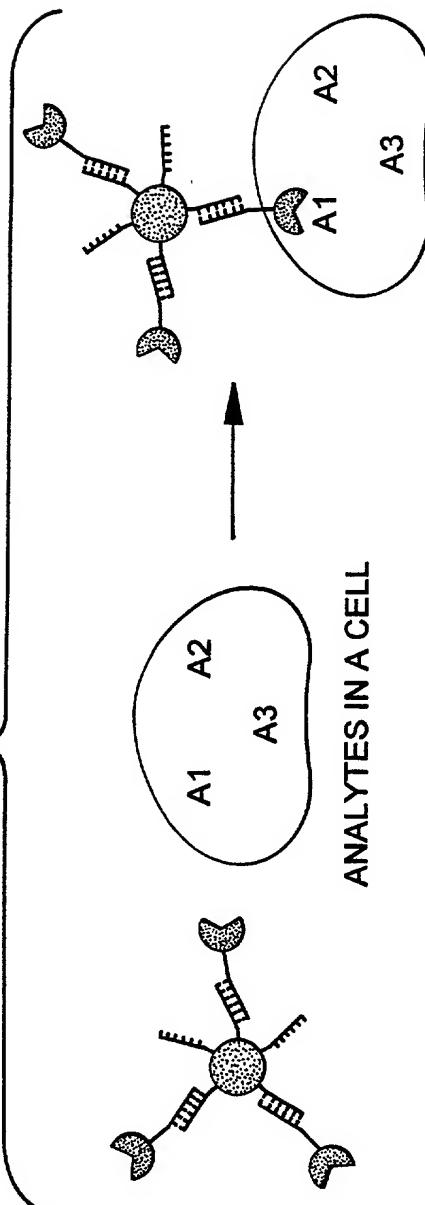
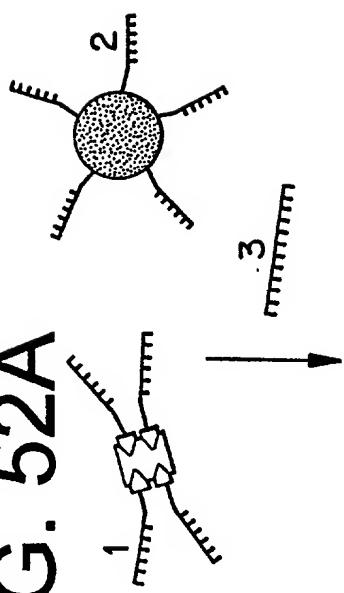
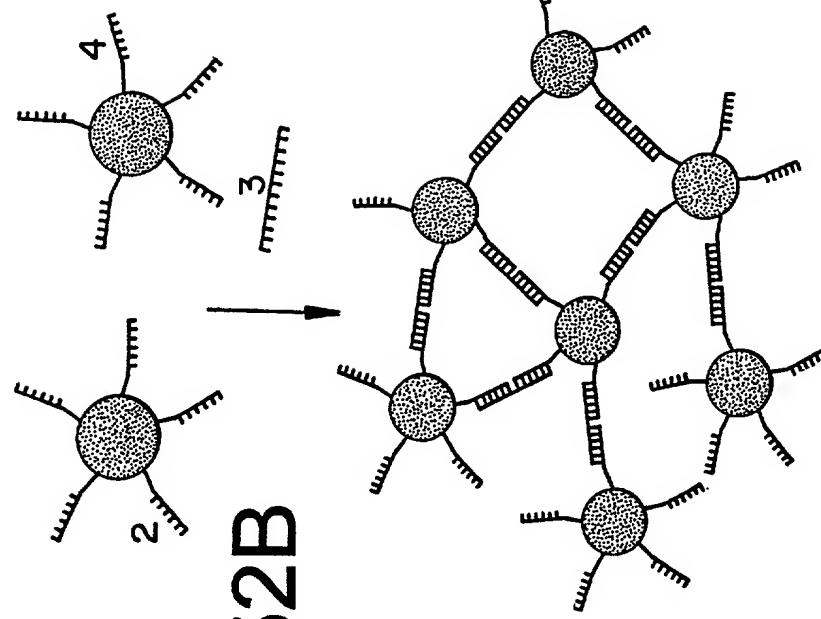
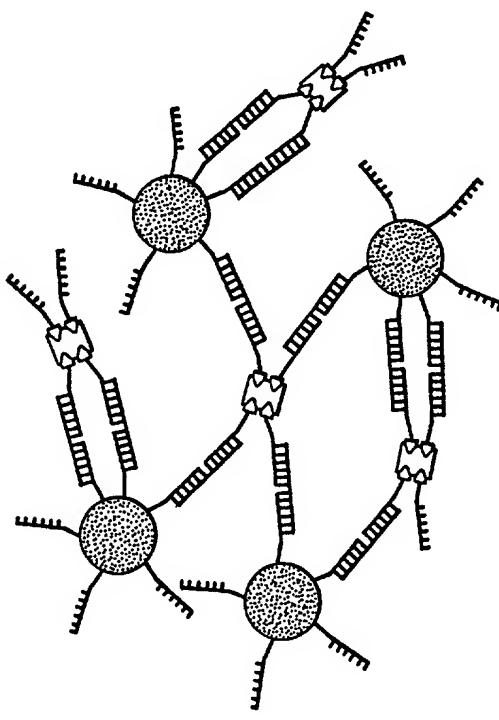


FIG. 51B



**FIG. 52A****FIG. 52B**

**1** 3' biotin-TEG-A10-ATG CTC AAC TCT 5' [SEQ. ID NO. 73]

**2** 5' SH(CH<sub>2</sub>)<sub>6</sub>-A10-CGC ATT CAG GAT 3' [SEQ. ID NO. 74]

**3** 5' TAC GAG TTG AGA ATC CTG AAT GCG 3' [SEQ. ID NO. 75]

**4** 3' SH(CH<sub>2</sub>)<sub>3</sub>-A10-ATG CTC AAC TCT 5'

● 13 nm Au NANOPARTICLES    [ ] STREPTAVIDIN

● 13 nm Au NANOPARTICLES

2 5' SH(CH<sub>2</sub>)<sub>6</sub>-A10-CGC ATT CAG GAT 3'

3 5' TAC GAG TTG AGA ATC CTG AAT GCG 3'

4 3' SH(CH<sub>2</sub>)<sub>3</sub>-A10-ATG CTC AAC TCT 5'

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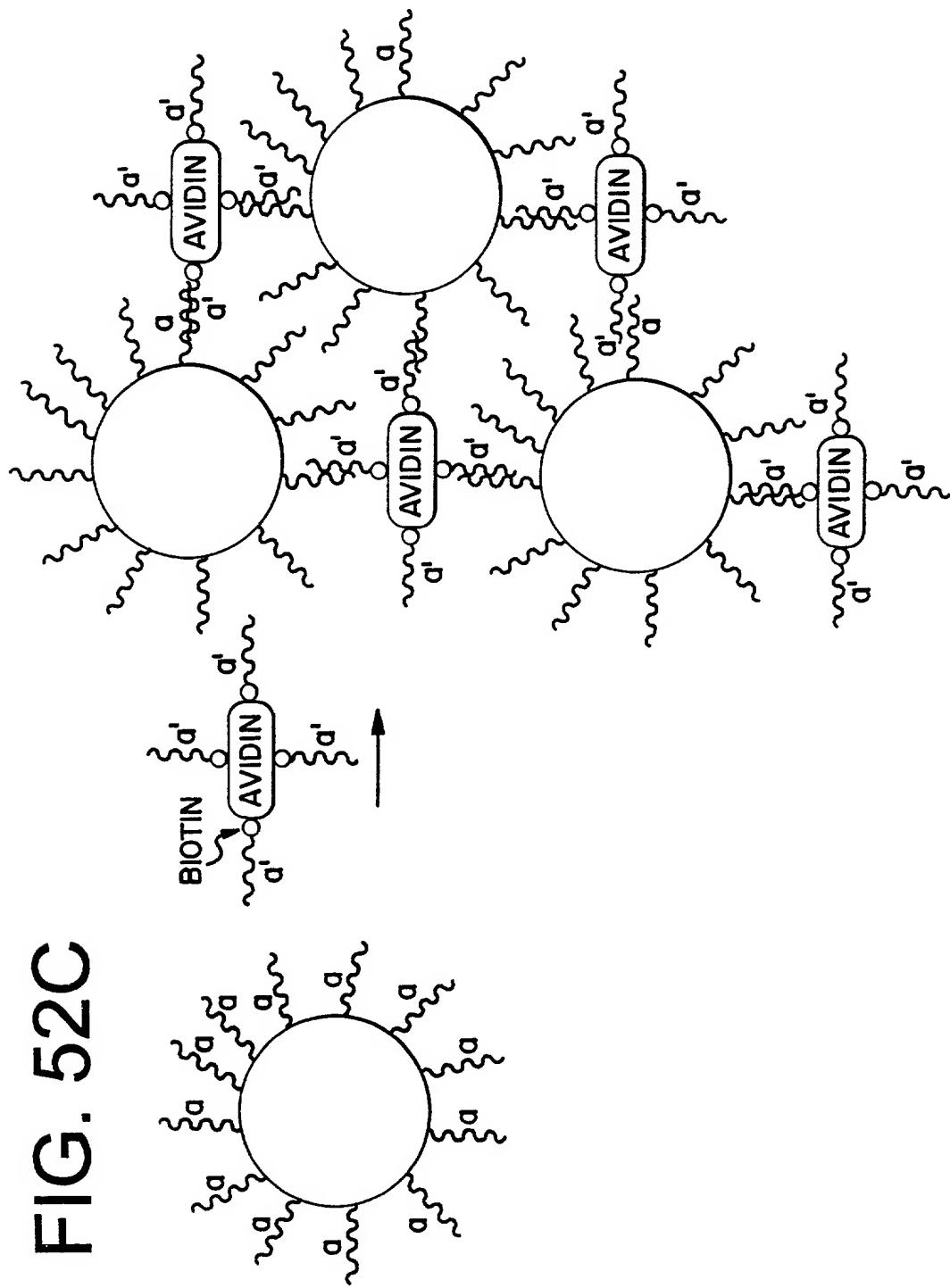


FIG. 53

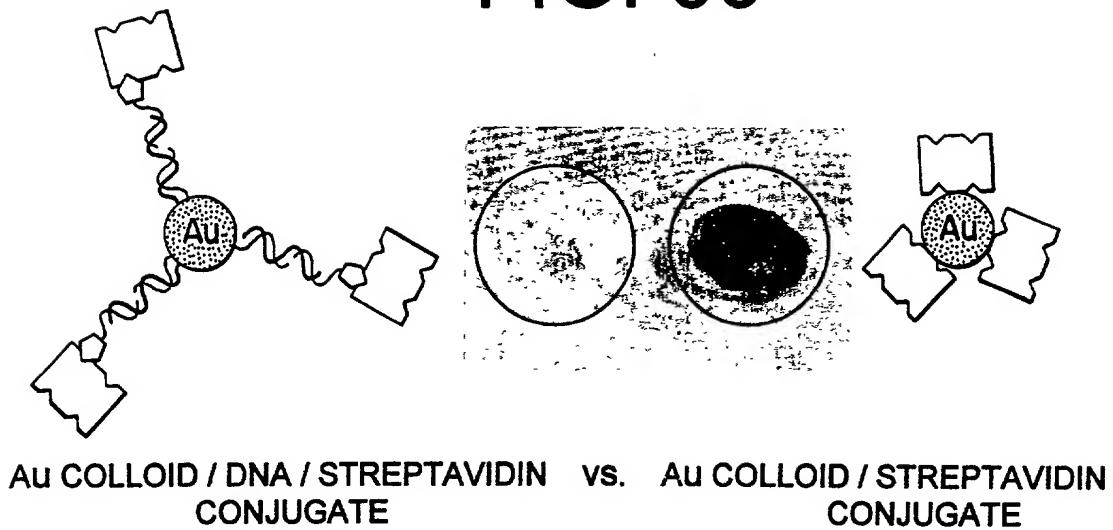
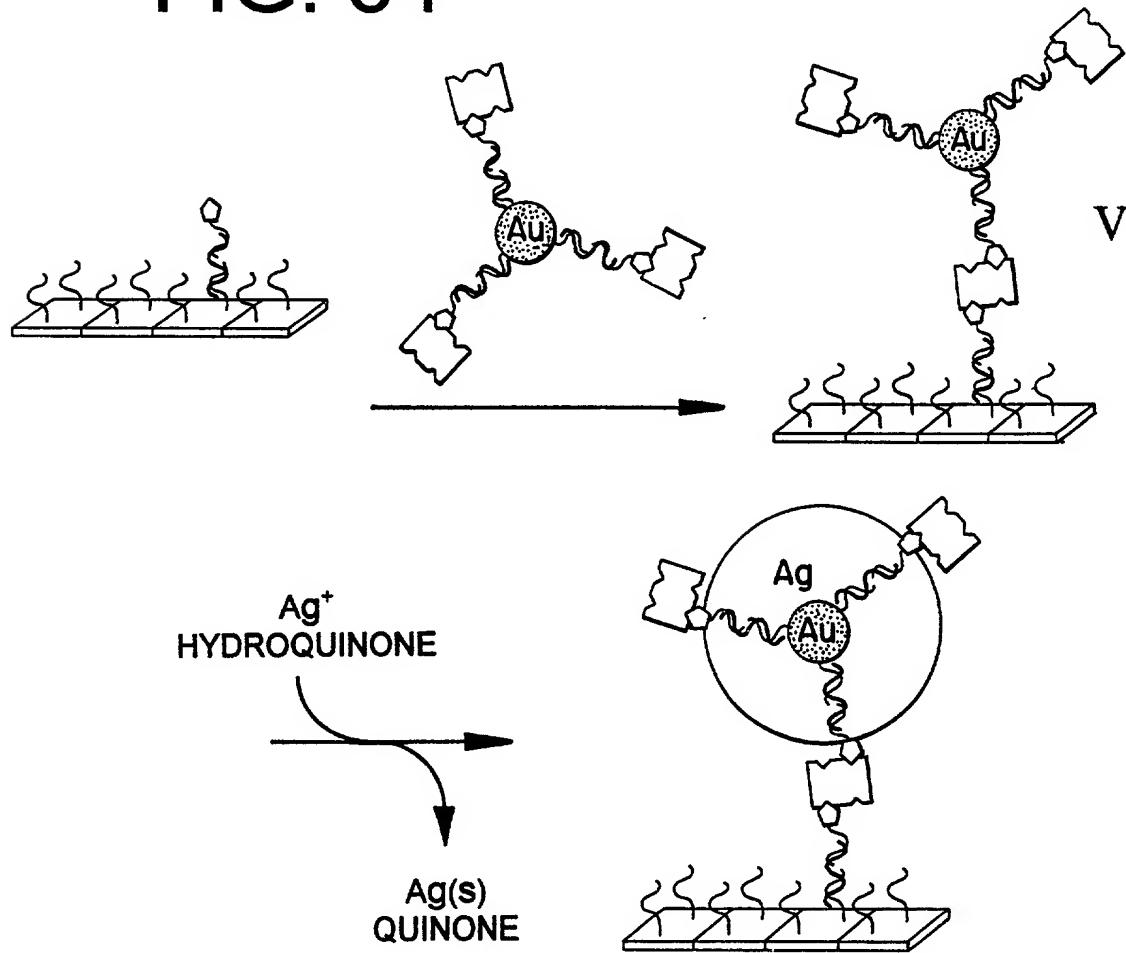
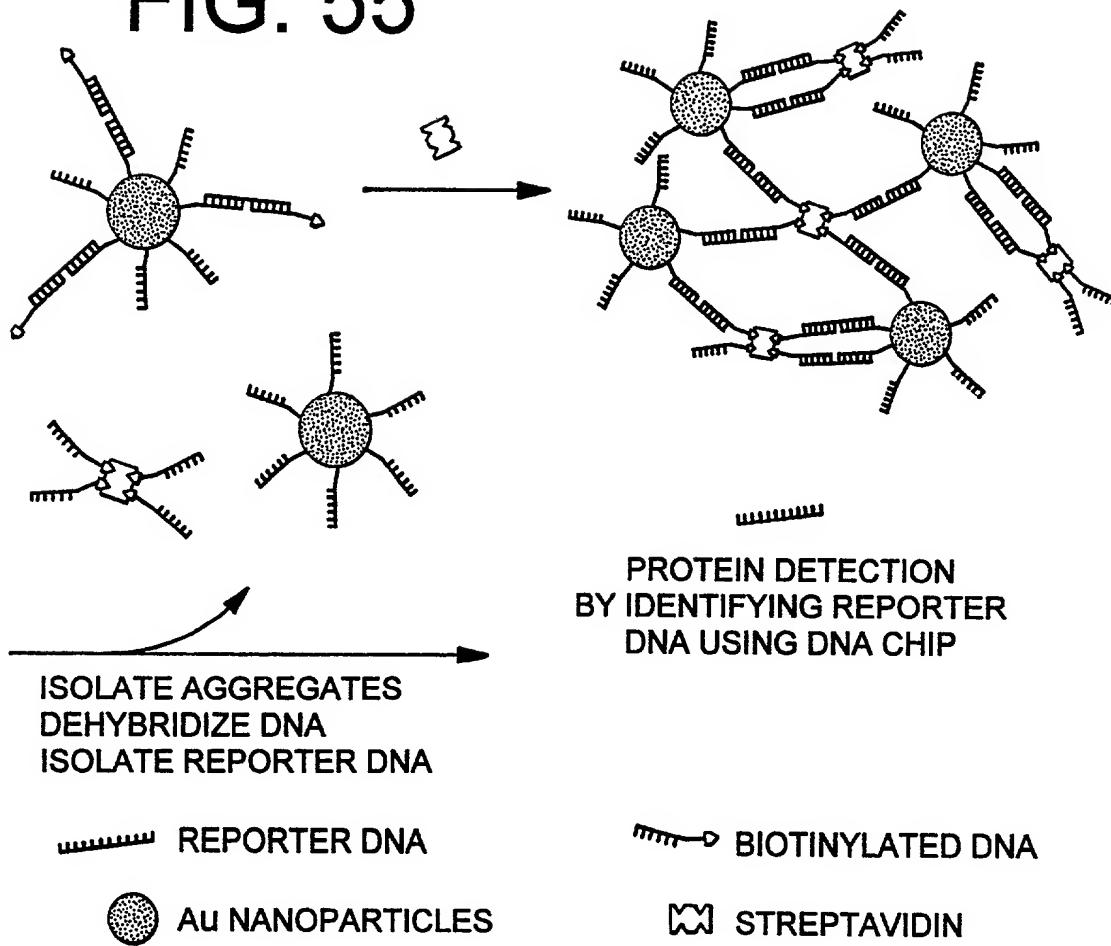


FIG. 54

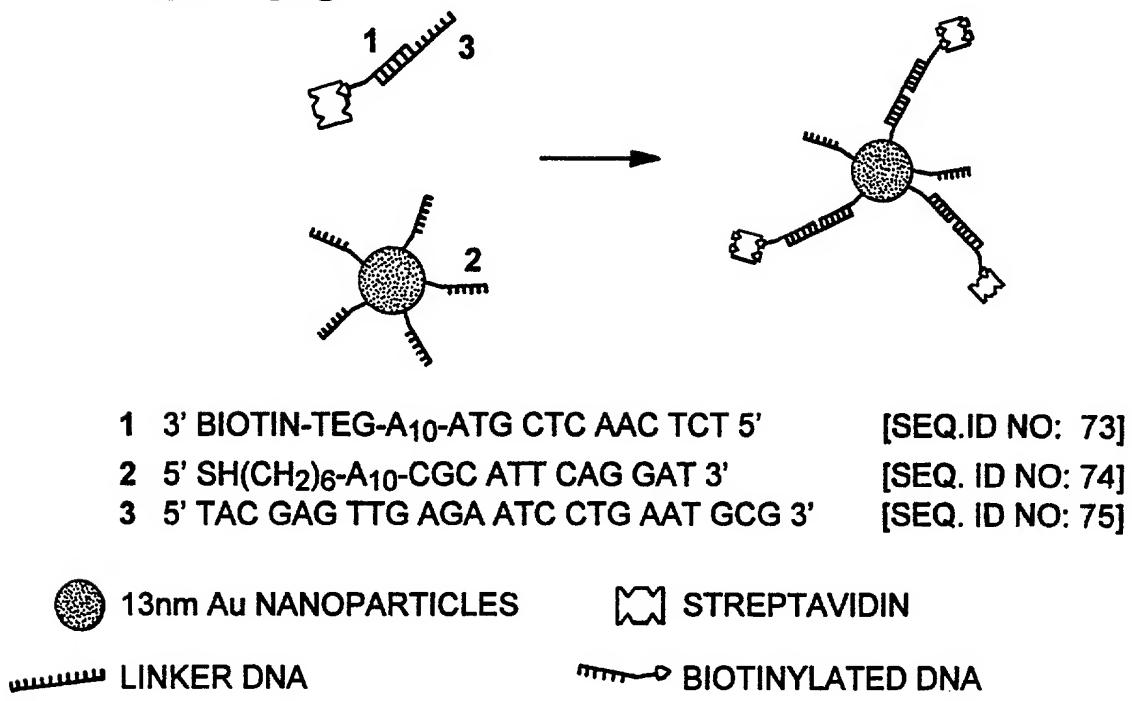


**FIG. 55**

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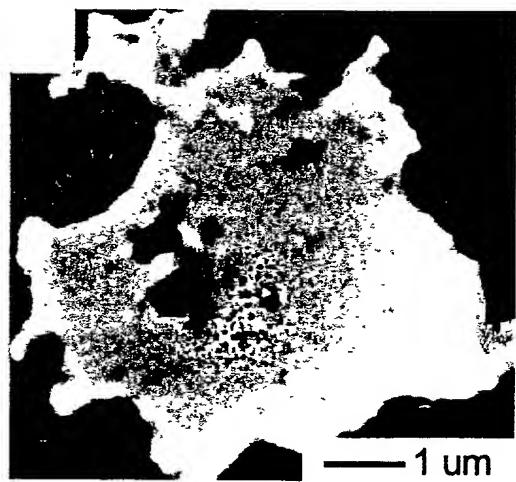


**FIG. 56**

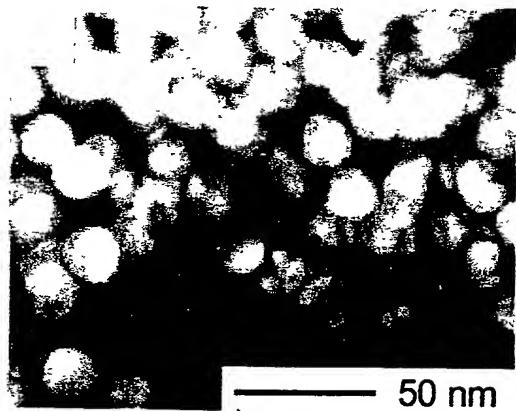


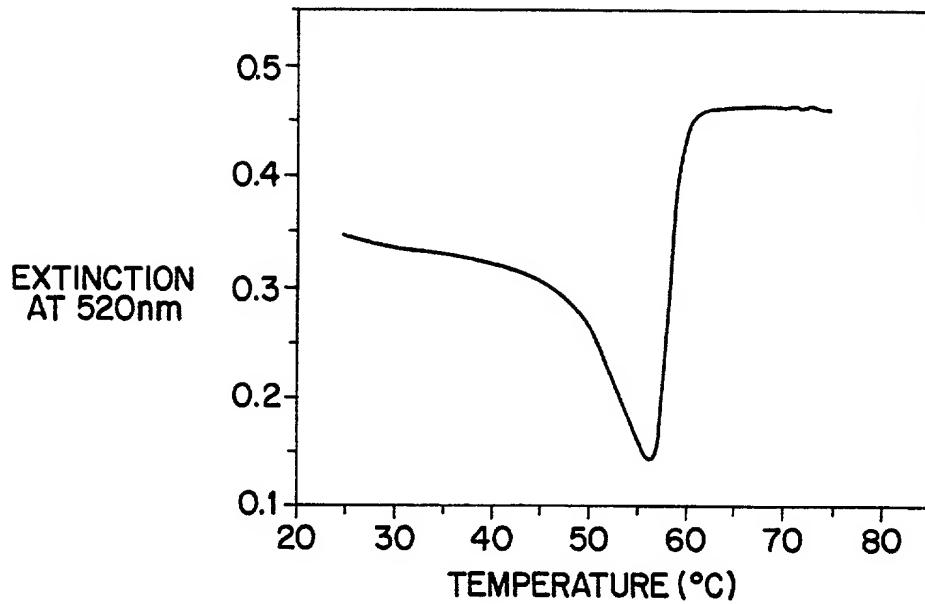
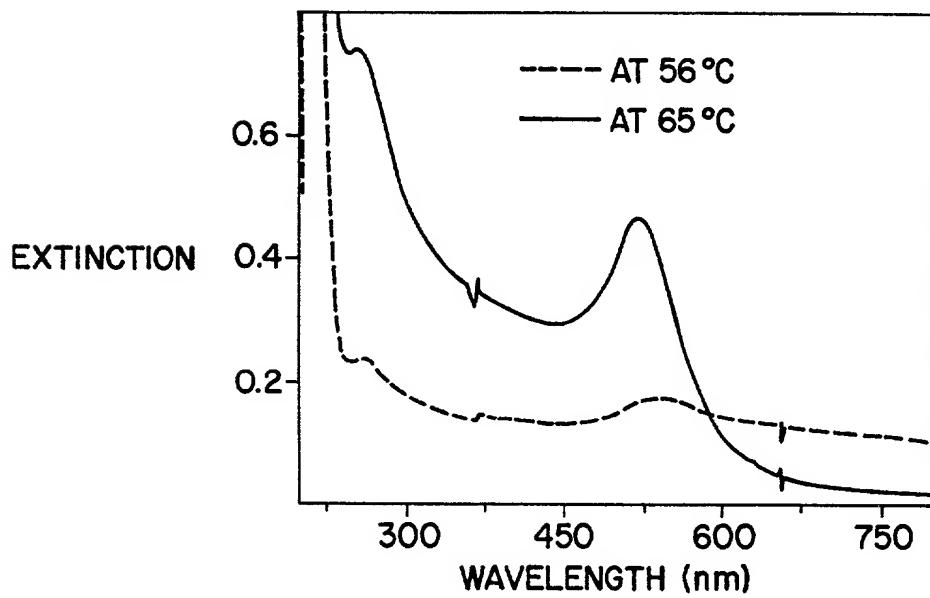
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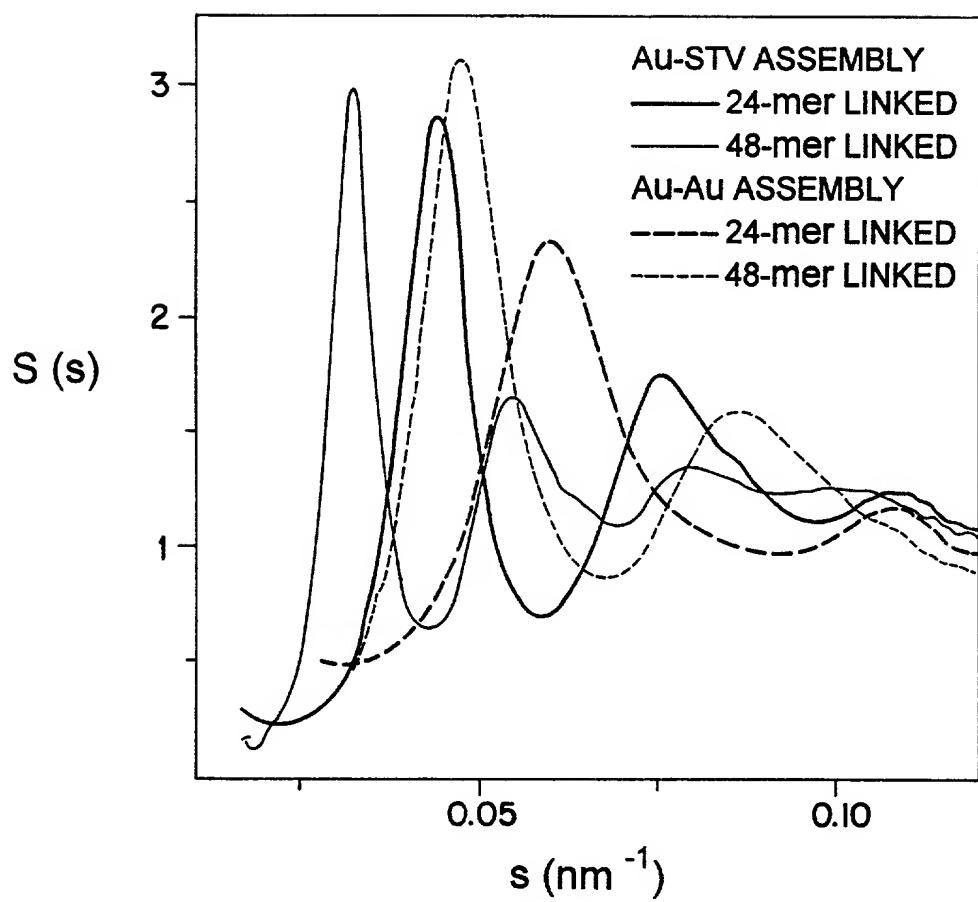
**FIG. 57A**



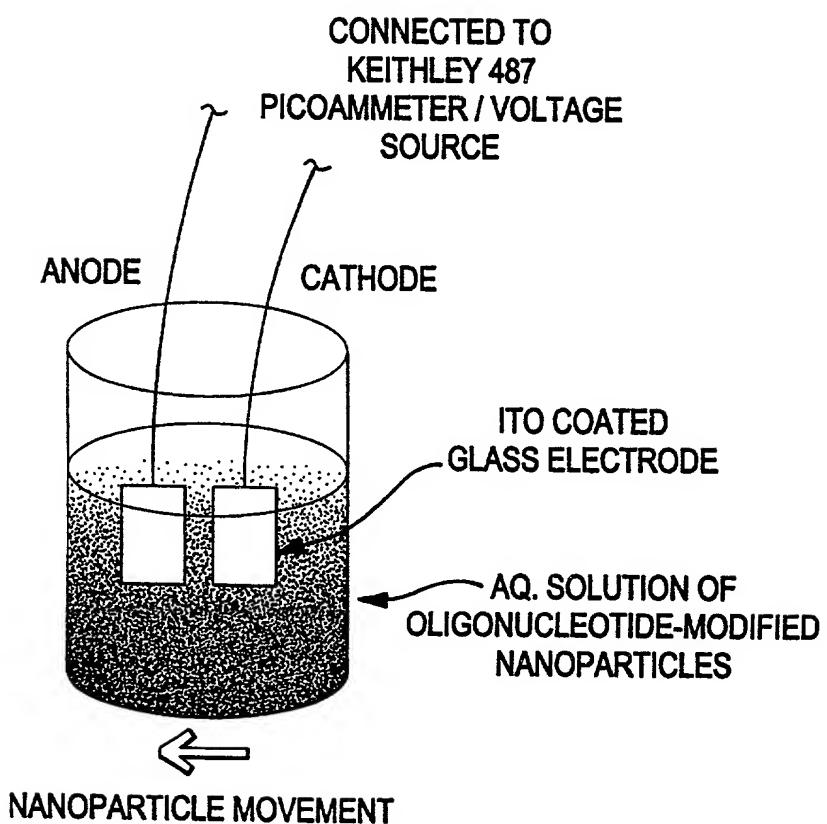
**FIG. 57B**



**FIG. 58A****FIG. 58B**

**FIG. 59**

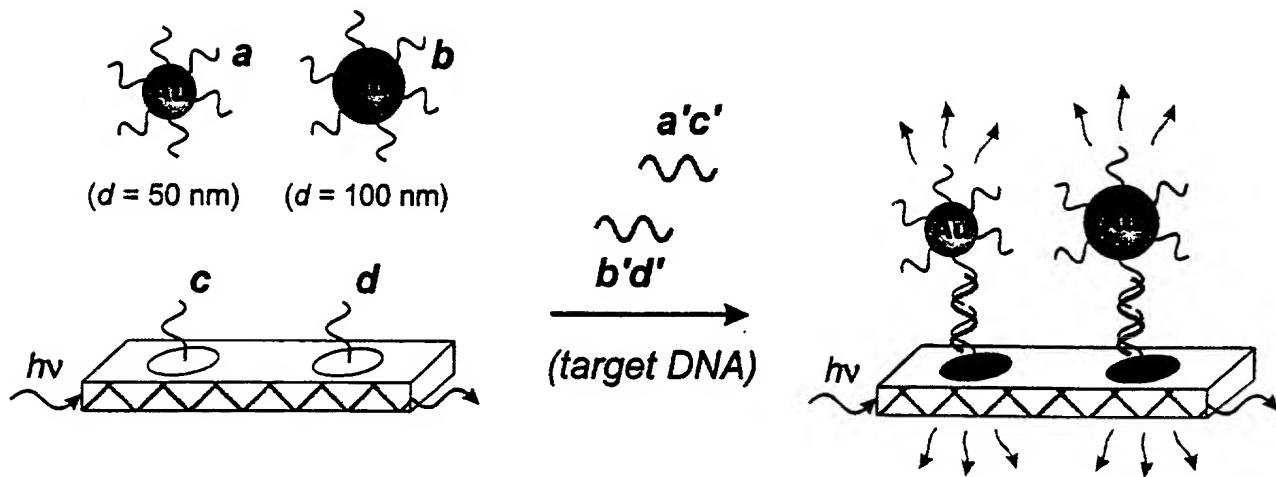
**FIG. 60**



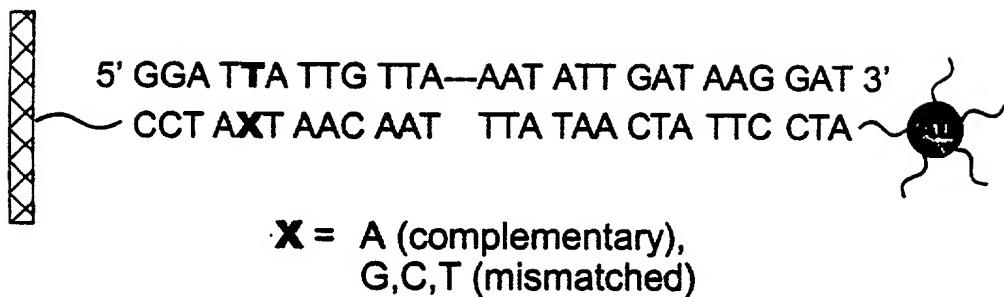
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Figure 6)

A



B



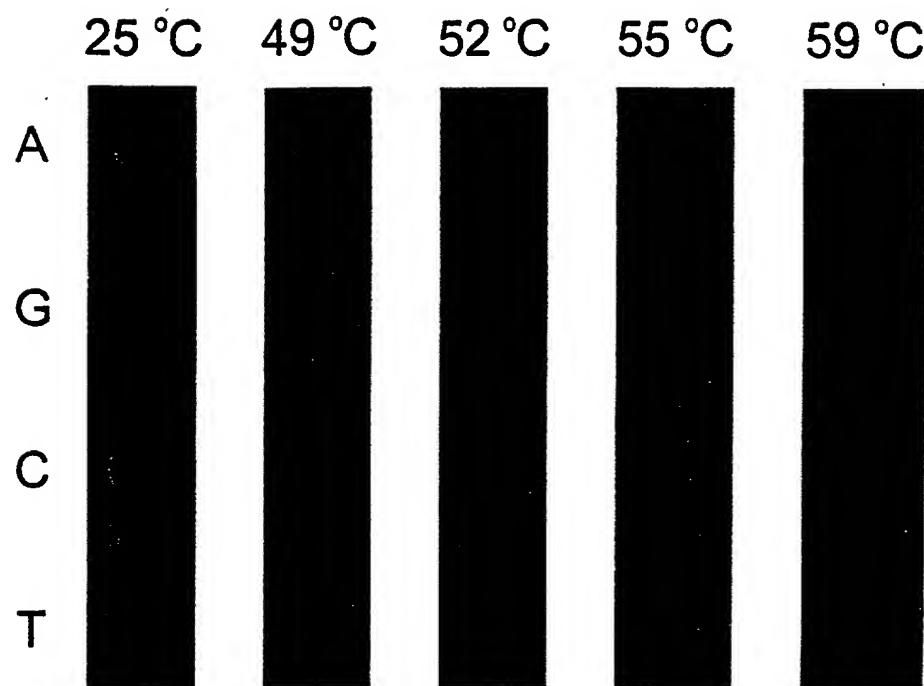
**Test for Target Sequence a'c'****Test for Target Sequence b'd'****A****B****C****D**

Figure 62

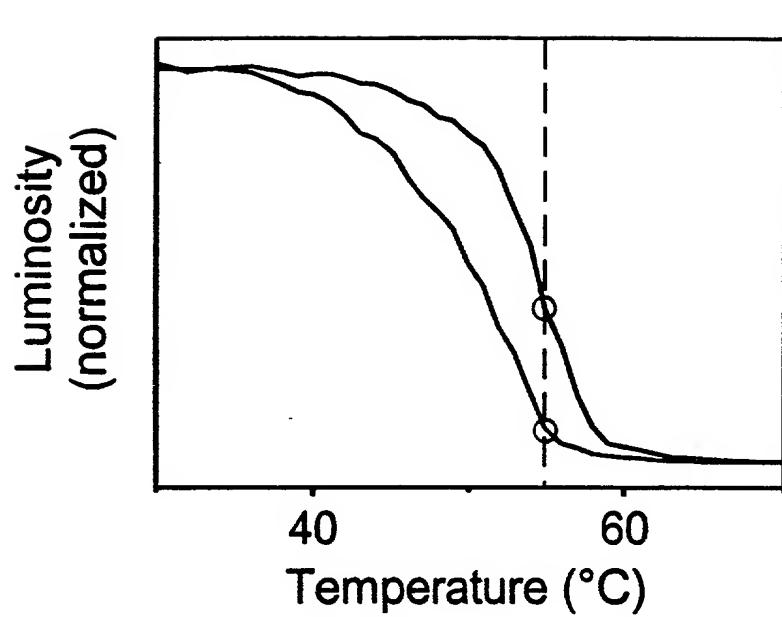
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A



B



G. Lu, T. A. Taton and C. A. Mirkin

Figure 63

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Figure 64

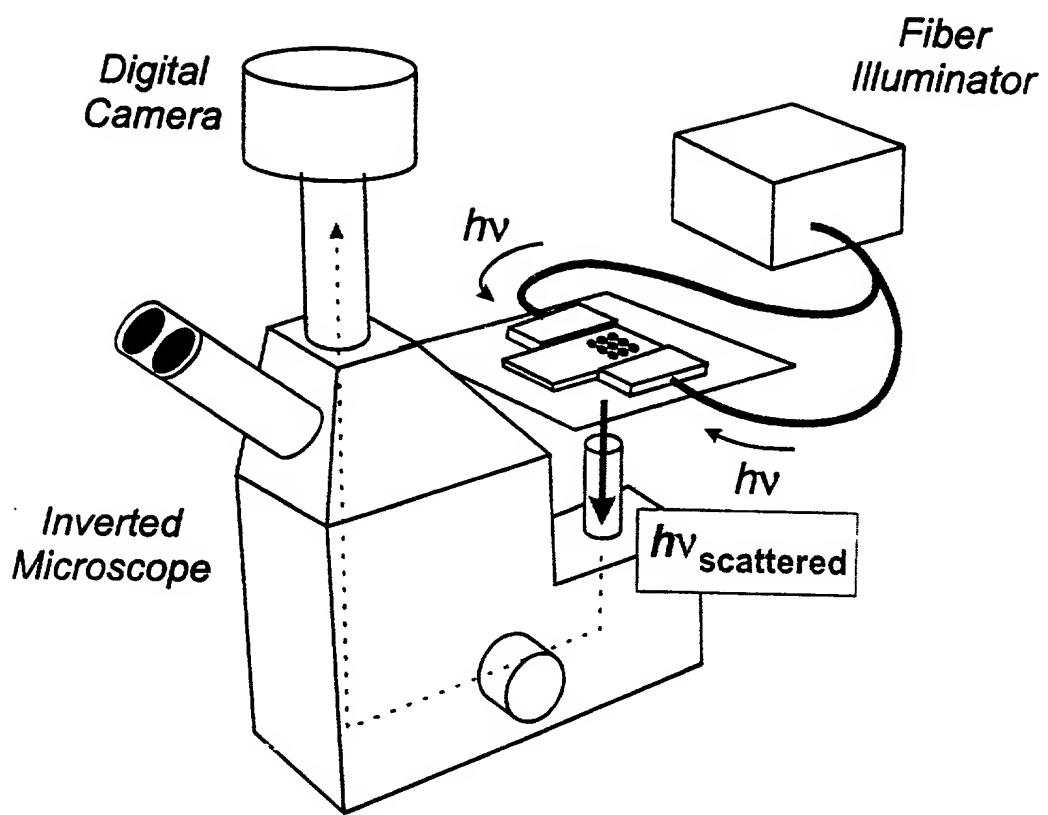
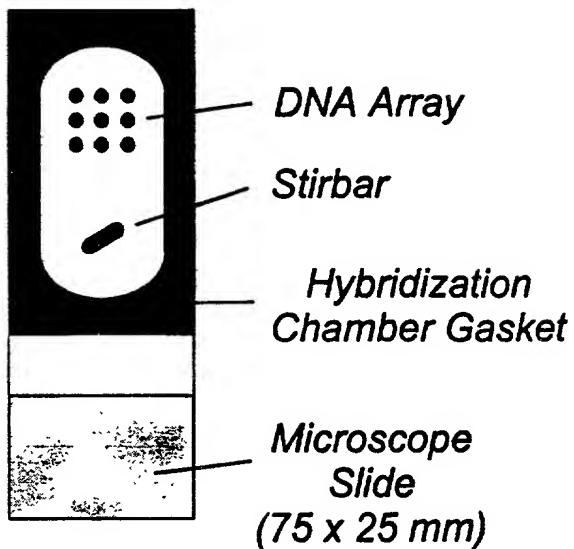


Figure 65

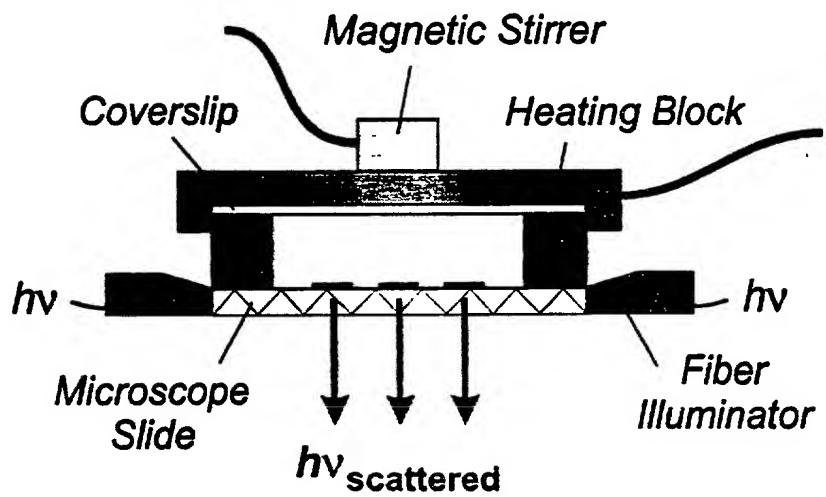
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S9

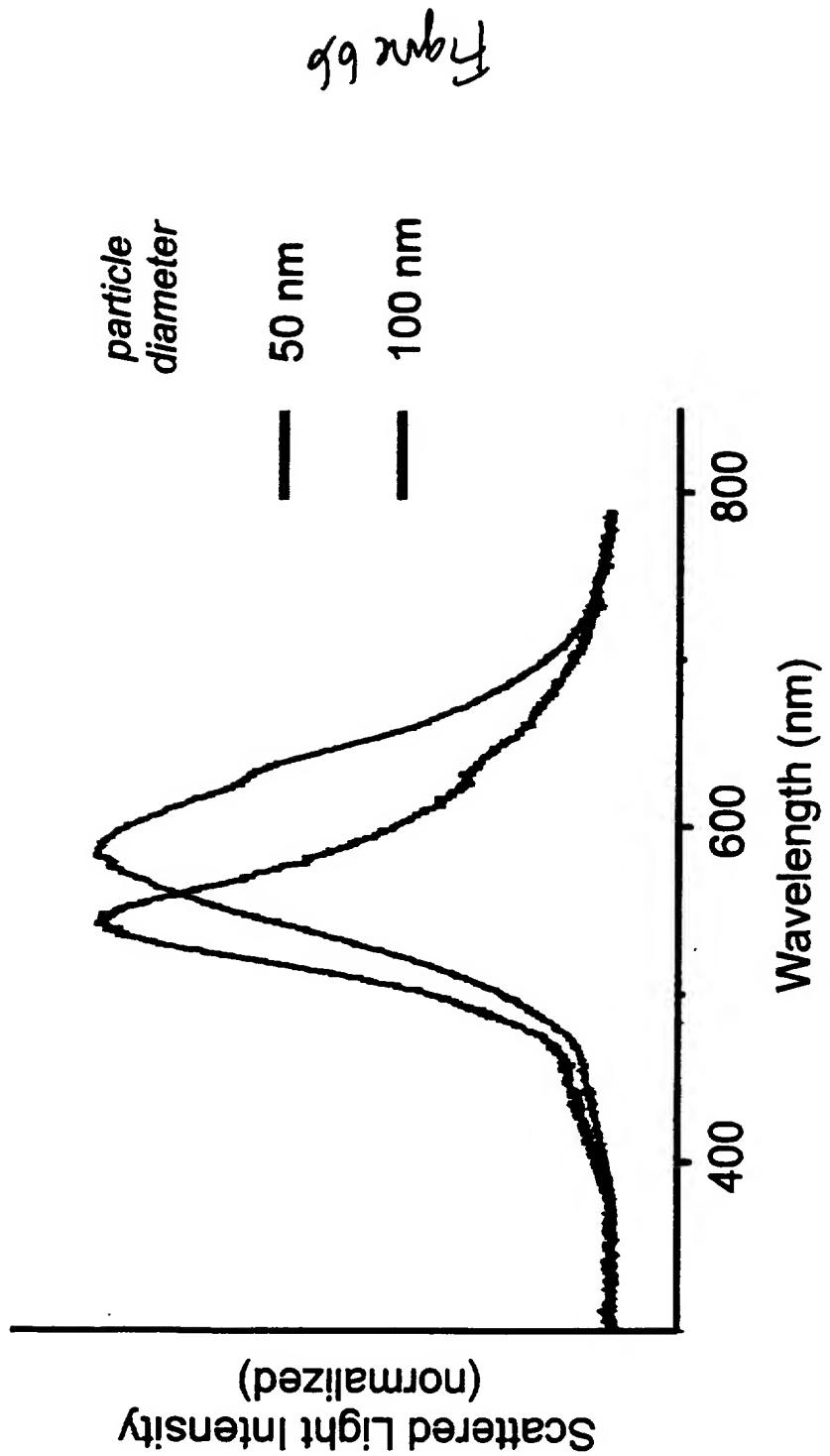
A



B



SCANNED, # 6



$\mathcal{H}/\mathcal{H}_1$

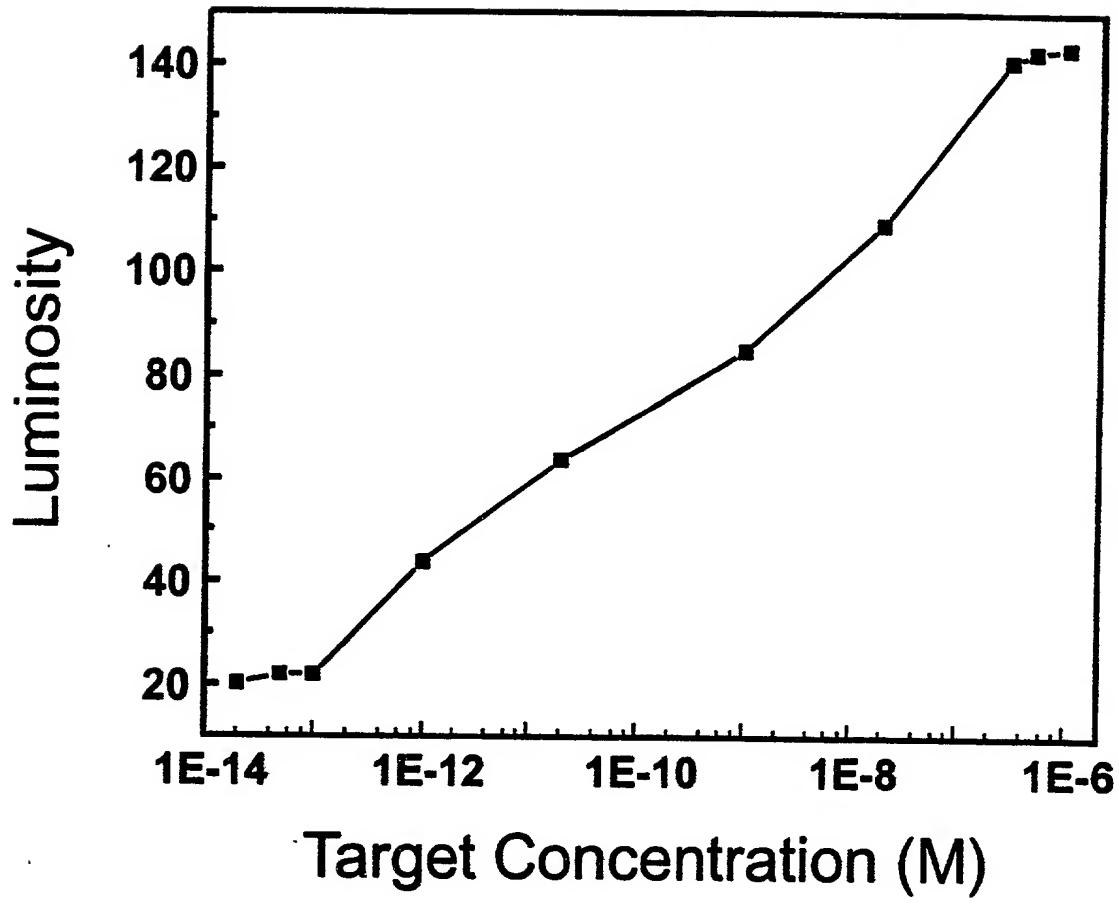


figure 67